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HOW TO MAKE A FLOWER GARDEN

An old-fashioned border of hardy perennials

How to
Make a Flower Garden

A Manual of Practical Information
and Suggestions

Illustrated

NEW YORK
DOUBLEDAY, PAGE & COMPANY
1903

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INTRODUCTION

The Spirit of the Home Garden

Simple desires, with every desire well planned and well carried out, result in the best gardens.
The garden must be yours; if it is another's it is not worth the while to you.
A good garden is the one that gives its owner the most pleasure: he may grow orchids or thistles.
The measure of success in the garden is the sensitive mind rather than the plants.

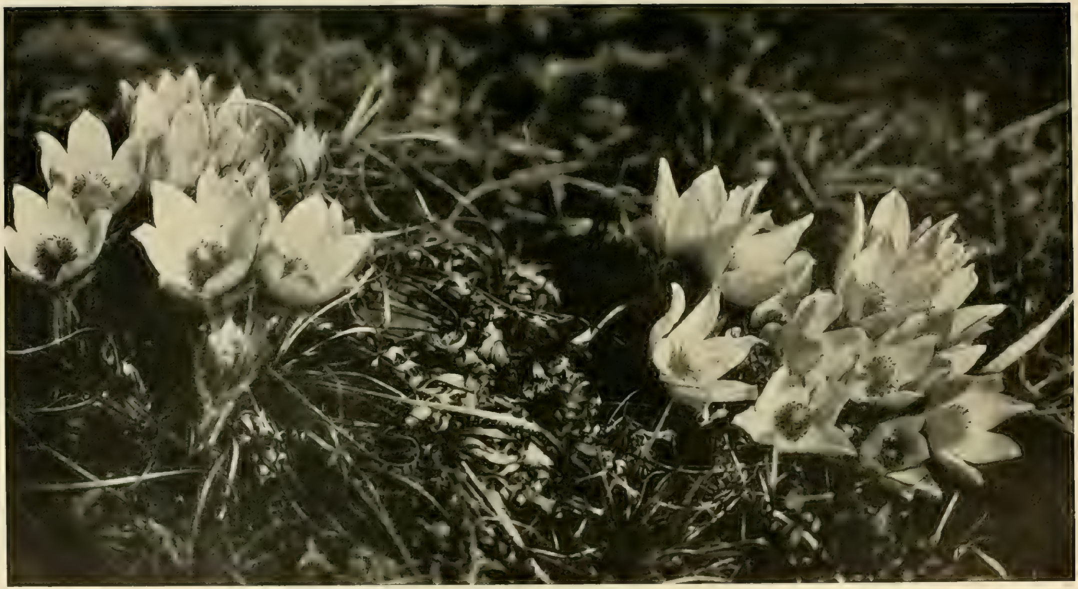
By L. H. Bailey

THE home garden is for the affections. It is for quality. Its size is wholly immaterial if only it have the best. I do not mean the rarest or the costliest, but the best—the best geranium or the best lilac. Even the fruit garden and the vegetable garden are also for the affections: one can buy ordinary fruits and vegetables—it never pays to grow them in the home garden. When you want something superior, you must grow it, or else buy it at an advanced price directly from some one who grows for quality and not for quantity. If you want the very choicest and the most personal products, almost necessarily you must grow them: the value of these things cannot be measured in money. The commercial gardener may grow what the market wants, and the market wants chiefly what is cheap and good looking. The home gardener should grow what the market cannot supply, else the home garden is not worth the while.

A garden is a place in which plants are grown, and "plants" are herbs and vines and bushes and trees and grass. Too often do persons think that only formal and pretentious places are gardens. But an open lawn about the house may be a garden; so may a row of hollyhocks along the wall or an arrangement of plants in the greenhouse. Usually there is some central feature to a garden, a theme to which all other parts relate. This may be a walk or a summer-house or a sun-dial or a garden bed or the residence itself, or a brook falling down the sward between trees and bushes and clumpy growths. There are as many forms and kinds of gardens as there are persons who have gardens; and this is one reason why the garden appeals to every one, and why it may become the expression of personality. You need follow no man's plan. The simplest garden is likely to be the best, merely because it is the expression of a simple and teachable life.

Grow the plants that you want, but do not want too many. Most persons when they make a garden order a quantity of labels. Fatal mistake! Labels are for collections of plants—collections so big that you cannot remember, and when you cannot remember you lose the intimacy, and when you lose the intimacy you lose the essence of the garden. Choose a few plants for the main plantings. These must be hardy, vigorous, sure to thrive whether it rains or shines. These plants you can buy in quantity and in large,

Plantago Purshii, one of the western plantains. These are good "specimens," displaying the characteristics of the species to perfection



The western pasque flower, one of the earliest and choicest of spring bloomers. Anemone patens, var. Nuttalliana

strong specimens. Each clump or group or border may be dominated by one kind of plant—foxgloves, hollyhocks, spireas, asters. The odd and unusual things you may grow as incidents, as jewelry is an incident to good dress. Miscellaneous mixtures are rarely satisfactory. The point is that the character of the home garden should be given by the plants that are most sure to thrive. The novelties and oddities should be subjects of experiment: if they fail, the garden still remains.

A pyrola, one of the native shin-leafs or wintergreens. A good suggestion for the mass-planting or colonising of wild flowers

The lawn should be the first care in any home ground. All effective planting has relation to this foundation. Homelikeness also depends upon it. Grass will grow anywhere, to be sure, but mere grass does not make a lawn. You must have a sod; and this sod must grow better every year. This means good and deep preparation of the land in the beginning, rich soil, fertilising each year, re-sowing and mending where the sod becomes thin.

Usually we water our lawns too much, making the grass shallow-rooted and causing it to fail early. Every inducement should be made for the grass roots to go down.

In very shady places, as under trees and wide eaves, it is very difficult to secure a good sod. In such cases we must rely on other plants for the carpet-cover. Of these other plants, the best for the North is the common running myrtle, or periwinkle. Sods of this make an immediate and persistent cover. Lily-of-the-valley also makes a fairly satisfactory ground-cover in some places. If the soil is damp, the moneywort may be tried, although it sometimes becomes a pest. Take note of the ground-cover in all shady places that you come across. You will get suggestions.

Put walks where they are needed—this is the universal rule; but be sure they are needed. In the beginning you will think you need more than you actually do need. How to get the proper curve? Perhaps you do not need a curve. There are two fixed points in every walk—the beginning and the ending. Some walks lack either one or the other of these points, and I have seen some that seemed to lack both. Go from one point to the other in the easiest and simplest way possible. If you can throw in a gentle curve, you may enhance the charm of it; and you may not. Directness and convenience should never be sacrificed for mere looks—for "looks" has no reason for being unless it is related to something.

For main walks that are much used, cement and stone flagging are good materials, because they are durable, and they keep down the weeds. There is no trouble in making a durable cement or "artificial stone" walk in the northern climates if the underdrainage is good and the cement is "rich." For informal walks, the natural loam may be good; or sharp gravel that will pack; or cinders; or tan-bark. For very narrow walks or trails in the back yard I like to sink a ten-inch-wide plank to the level of the sod. It marks the direction, allows you dry passage, the lawn-mower passes over it, and it will last for several years with no care whatever. In flower gardens, a strip of sod may be left as a walk; but the disadvantage of it is that it retains dews and the water of rainfall too long. Some of the most delightful periods for viewing the garden are the early morning and the "clearing spell" after a shower.

There should be no fence unless there is a reason for it. Some persons seem to want fences just for the purpose of having them. Of themselves, open fences are rarely ornamental or desirable. They are expensive property.

The Japanese Iris (Iris laevigata, but commonly known as I. Kaempferi), now grown in many forms and always useful

The money put into a fence will often buy enough plants to stock the place. Front fences, in particular, are rarely desirable. The street and the walk sufficiently define the place. Now and then a person wants a front fence to give his place privacy. This may be a perfectly legitimate desire, but the requirements are usually best satisfied by means of a low and substantial wall. A fence means protection. A wall may mean seclusion; and it may easily be made a part of the architectural features of the place.

The greenhouse hydrangea as a summer tub plant

Walls usually work well into the planting designs of a home ground, but the instances where fences do this are exceedingly rare.

Even in the back yard a wall may be preferable to a fence, but pecuniary considerations may determine for a fence; and, moreover, a real fence is more in keeping in a rear yard, for that yard is usually most in danger of molestation. In the back yard, the fence may become also a screen and a shelter. Usually it can be covered with vines—sometimes with grapevines--to advantage, or be "planted out" with bushes and trees. It is good practice to allow the fence to obtrude itself as little as possible.

As a whole, the garden is maintained for its general effect. It is a part of an establishment, of which the residence, the barn, and the boundaries

An old-time phyllocactus, one of the species sometimes, but improperly, called "night-blooming cereus"

Spring is here when the magnolia blooms. Magnolia Yulan (M. conspicua)

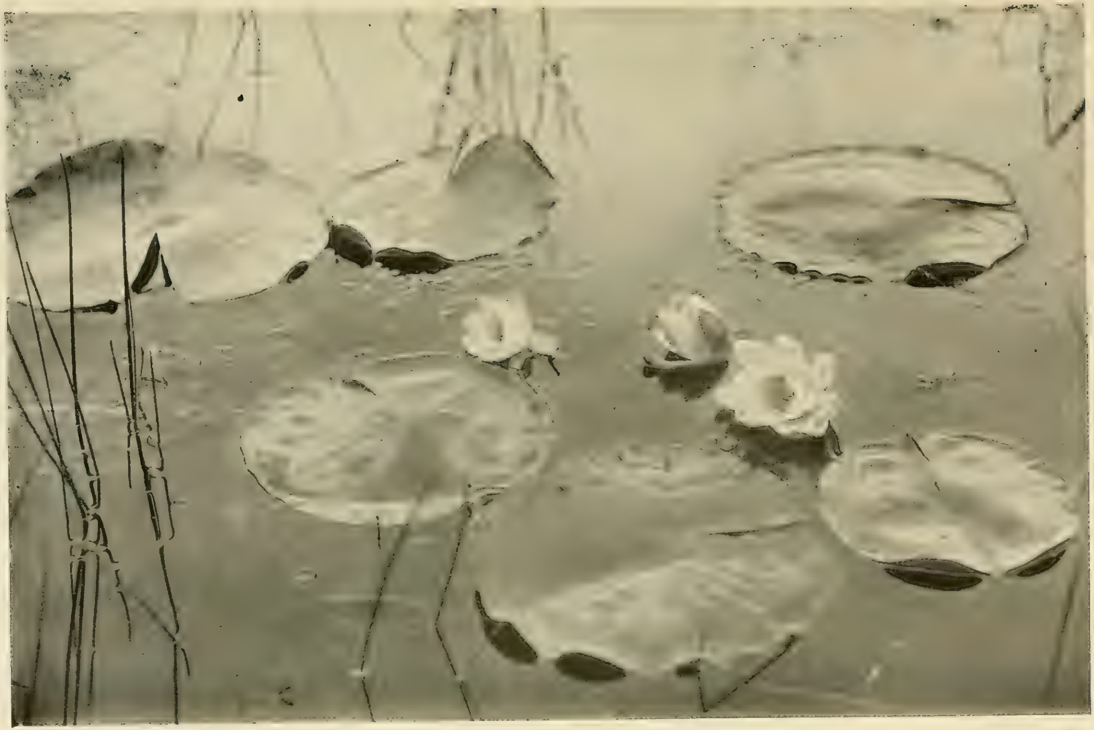
are other parts. But the garden should also have certain parts that are for distinct or particular service, that should be to the general garden what pantries and bedrooms and closets are to the house. These garden-rooms are for vegetables or flowers or fruits or sweet herbs. These things are grown for use in the family, not for their effect as a part of a garden picture. They can be grown best in special areas set aside for this particular purpose, where the soil can be regularly tilled and each plant given full room and conditions to develop to its best. This is as true of flowers as it is of beets or strawberries. The fact that we grow flowers also as a part of the garden picture should not obscure the fact that we also grow them for cutting and

To illustrate the beauty of a bush (Ligustrum Ibota, var. Regelianum) for decoration and exhibition. When China asters are wanted because they are China asters, grow them where and how China asters thrive best; if they are wanted as a part of the general garden effect, grow them where and how this effect can be best secured.

The place for the service garden is at one side or the rear—preferably in the back yard. Grow the things in rows.

Give the children an opportunity to make a garden. Let them grow what they will. Let them experiment. It matters less that they produce good plants than that they try for themselves. A place should be reserved. Let it be well out of sight, for the results may not be ornamental. However, take care that the conditions are good for the growing of plants—good soil, plenty of sun, freedom from the encroachments of tree-roots and from molestation of carriage-drive or chickens. It may be well to set the area off by a high fence of chicken-wire screen; then cover the fence with vines. Put a seat in the enclosure. This will constitute an outdoor nursery room; and while the child is being entertained and is gaining health he may gain experience and nature-sympathy at the same time.

There are two kinds of interest in plants—the interest in the plant itself for its own sake, and the interest in plants as part of a mass, or as elements in a picture. The former is primarily the interest of the plant-lover or the botanist; the latter is the interest of the artist. Fortunately, many persons have both these elements highly developed, and every person can train himself to appreciate both points of view. Now, a home ground is one thing. It is, or should be, homogeneous in its composition. It should appeal to one as a unit: the entire place should produce one effect. This effect may be that of rest or retreat or seclusion or homelikeness. In order to produce this harmony, plants must be placed with relation to each other and to the general design of the place. The ability to do this kind of planting is one of the attributes of a good landscape gardener. He produces good "effects" and harmonies. He thinks less of plants as mere plants than he does as parts of a composition. He sees them much as a painter does. All this is contrary to the general conception of planting. Most persons, I fear, think of a plant only as a plant, and are content when it is planted. But merely to plant a plant may have little merit in the home grounds: robins and squirrels do that much.



The native white water lily (Nymphaea tuberosa) in its native haunts. Minnesota

HOW TO MAKE A FLOWER GARDEN

HOW TO MAKE A FLOWER GARDEN

CHAPTER I. ANNUALS

I. The Best Kinds and How to Grow Them

By L. H. Bailey

Poppies

ANNUAL plants are those that you must sow every year. From seed to seed is only a year or less. Annual plants probably comprise half the flowering plants of the world. They quickly take advantage of the moving seasons—grow, blossom, and die before they are caught by the blight of winter or of the parching dry season. They are shifty plants, now growing here, then absconding to other places. This very uncertainty and capriciousness makes them worth the while. The staid perennials I want for the main and permanent effects in my garden, but I could no more do without annuals than I could do without the spices and the condiments at the table. They are flowers of a season: I like flowers of a season.

Annual wallflowers

Of the kinds of annuals there is almost no end This does not mean that all are equally good. For myself, I like to make the bold effects with a few of the old profuse and reliable kinds. I like whole masses and clouds of them. Then the other kinds I like to grow in smaller areas at one side, in a half-experimental way. There is no need of trying to grow equal quantities of all the kinds that you select. There is no emphasis and no modulation in such a scheme. There should be major and minor keys.

The minor keys may be of almost any kind of plant. Since these plants are semi-experimental, it does not matter if some of them fail outright. Why not begin the list at A and buy as many as you can afford and can accommodate this year, then continue the list next year? In five or ten years you will have grown the alphabet, and will have learned as much horticulture and botany as most persons learn in a college course. And some of these plants will become your permanent friends.

For the main and bold effects I want something that I can depend on. There I do not want to experiment. Never fill a conspicuous place with a kind of plant that you have never grown.

The kinds I like best are the ones easiest to grow. My personal equation, I suppose, determines this. Zinnia, petunia, marigold, four-o'clock, sunflower, phlox, scabiosa, sweet sultan, bachelor's-button, verbena, calendula, calliopsis, morning-glory, nasturtium, sweet pea—these are some of the kinds that are surest, and least attacked by bugs and fungi. I do not know where the investment of five cents will bring as great reward as in a packet of seeds of any of these plants.

Before one sets out to grow these or any other plants he must make for himself an ideal. Will he grow for a garden effect, or for specimen plants or specimen blooms? If for specimens, then each plant must have plenty of room and receive particular individual care. If for garden effect, then see to it that the entire space is solidly covered, and that you have a continuous blaze of colour. Usually the specimen plants would best be grown in a side garden, as vegetables are, where they can be tilled, trained, and severally cared for.

There is really a third ideal, and I hope that some of you may try it—to grow all the varieties of one species. You really do not know what the China aster or the balsam is until you have seen all the kinds of it. Suppose that you ask your seedsman to send you one packet of every variety of cockscomb that he has. Next year you may want to try stocks or annual poppies, or something else. All this will be a study in evolution.

There is still a fourth ideal—the growing for gathering or "picking." If you want many flowers for house decoration and to give away, then grow them at one side in regular rows as you would potatoes or sweet corn. Cultivate them by horse- or wheel-hoe. Harvest them in the same spirit that

Zinnias—always easy to grow and generous of color

you would harvest string beans or tomatoes; that is what they are for. You do not have to consider the "looks" of your garden. You will not be afraid to pick them. The old stalks will remain, as the stumps of cabbages do. When you have harvested an armful your garden is not despoiled.

I like each plant in its season. China aster is a fall flower. In early summer I want pansies or candytufts and other early or quick bloomers For the small amateur garden, greenhouses and hotbeds are unnecessary, and they are usually in the way. There are enough kinds of annuals that may be sown directly in the open ground, even in New York, to fill any garden. All those I have mentioned are such. In general, I should not try to secure unusually early effects in any kind of plant by starting it extra early. I should get early effects with kinds of plants that naturally are early. Let everything have its season. Do not try to telescope the months.

You can sow the seeds of most annuals even in May. I have sown China asters in the open ground in early June in New York State and have had excellent fall bloom.

The modern sweet pea

China asters—the comet type

Things come up quickly and grow rapidly in May and June. They hurry. Don't expect to get spring bloom from annuals, but rather from perennials—the spring bulbs, soft bleeding-hearts, spicy pinks, bright-eyed polyanthuses, and twenty more.

Make the soil rich fine and soft and and deep. There are some plants for which the soil can be made too rich, of course, but most persons do not err in this direction. For sweet peas there is this danger, for these are nitrogen gatherers, and the addition of nitrogenous manures makes them run too much to vine. The finer and more broken down the manure the better. Spade it in. Mix it thoroughly with the soil. If the soil is clay-like, see that fine manure is thoroughly mixed with the surface layer to prevent "baking."

Watering is an exacting labor, and yet half of it is usually unnecessary. The reasons why it is unnecessary are two: the soil is so shallowly prepared that the roots do not strike deep enough; we waste the moisture by allowing the soil to become hard, thereby setting up capillary connection with the atmosphere and letting the water escape. See how moist the soil is in spring. Mulch it so that the moisture will not evaporate. Mulch it with a garden rake by keeping the soil loose and dry on top. This loose, dry soil is the mulch. There will be moisture underneath. Save water rather than add it. Then when you do have to water the plants, go at it as if you meant it. Do not dribble and piddle. Wet the soil clear through. Wet it at dusk or in cloudy weather. Before the hot sun strikes it, renew your mulch, or supply a mulch of fine litter. As many plants are spoiled by sprinkling as by drought. Bear in mind that watering is only a special practice; the general practice is so to fit and maintain the ground that the plants will not need watering.

The less your space the fewer the kinds you should plant. Have enough of each kind to be worth the while and the effort. It is as much trouble to raise one plant as a dozen.

It is usually best not to try to make formal "designs" with annuals. Such designs are special things, anyway, and should be used sparingly, and be made only by persons who are skilled in such work. A poor or unsuccessful design is the sorriest failure that a garden can have. Grow the plants for them-

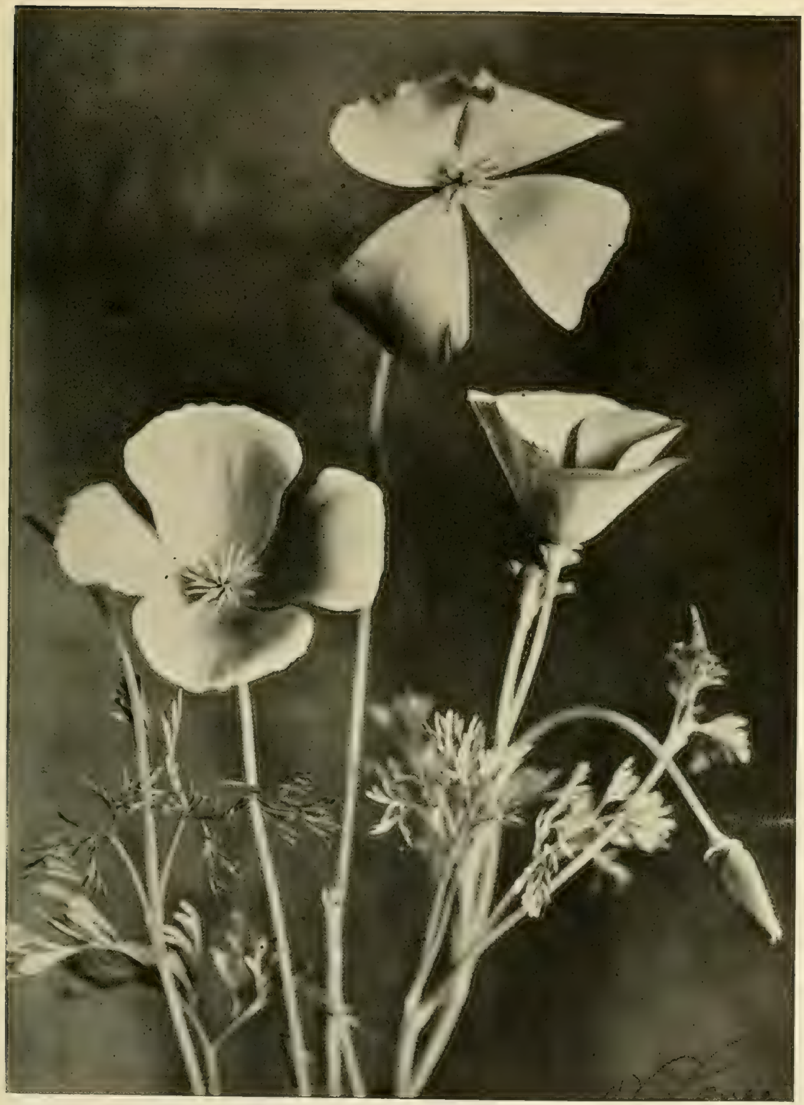
Japanese morning-glories

selves—pinks because they are pinks, alyssum because it is alyssum, not because they may form a part of some impossible harp or angel.

This brings up a discussion of the proper place to put the annuals. Do not put them in the lawn: you want grass there, and grass and annuals do not thrive well together. Supposing that you grow the annuals for garden effect, there are two ways of disposing them—to grow in beds or in borders. Sometimes one method is better and sometimes the other. The border method is the more informal, and therefore the simpler and easier, and its pictorial effect is usually greater, but in some places there are no boundary lines that can be used for borders. Then beds may be used; but make the beds so large and fill them so full that they will not appear to be mere play-patches. Long beds are usually best. Four or five feet wide is about the limit of ease in working in them. The more elaborate the shape of the bed, the more time you will consume in keeping the geometry straight and the less on having fun with the plants. Long points that run off into the grass—as the points of a star are particularly worrisome, for the grass-roots lock hands underneath and grab the food and moisture. A rectangular shape is best if you are intent only on growing flowers. Of course, if your heart is set on having a star on the lawn, you should have it; but you would better fill it with coloured gravel.

It is surprising how many things one can grow in an old fence. The four-o'clocks shown on page 17 illustrate this point. Most persons owning this place would think that they had no room for flowers; yet there the four-o'clocks are, and they take up no room. Not all annuals will thrive under such conditions of partial neglect. The large-seeded, quick-germinating, rapid-growing kinds will do best. Sunflower, sweet pea, morning-glory, Japanese hop, zinnia, big marigold and amaranths are some of the kinds that may be expected to hold their own. If the effort is made to grow plants in such places, it is important to give them all the advantage possible early in the season, so that they will get well ahead of grass and weeds. Spade up the ground all you can. Add a little quick-acting fertiliser. It is best to start the plants in pots or small boxes, so that they will be in advance of the weeds when they are set out.

First and last, I have grown practically every annual offered in the American trade. It is surprising how few of the uncommon or little-known sorts really have great merit for general purposes. There is nothing yet to take the place of the oldtime groups, such as amaranths, zinnias, calendulas,



The California poppy—Eschscholtzia Californica

daturas, balsams, annual pinks, candytufts, bachelor's-buttons, wallflowers, gilias, larkspurs, petunias, gaillardias, snapdragons, cockscombs, lobelias, coreopsis or calliopsis, California poppies, four-o'clocks, sweet sultans, phloxes, mignonettes, scabiosas, dwarf nasturtiums, marigolds, China asters, salpiglossis, nicotianas, pansies, portulacas, castor beans, poppies, sunflowers, verbenas, stocks, alyssums, and such good old running plants as scarlet runners, sweet peas, convolvuluses, ipomeas, nasturtiums, balloon vines and cobeas. Of the annual vines of recent introduction, the Japanese hop has at once taken a prominent place for the covering of fences and arbors, although it has no floral beauty to recommend it.

For bold mass-displays of colour in the rear of the grounds or along the borders, some of the coarser species are desirable. My own favourites for such use are sunflower, castor bean, and striped Japanese corn for the back rows; zinnias for bright effects in the scarlets and lilacs; African marigolds for brilliant yellows; nicotianas for whites. Unfortunately, we have no robust-growing annuals with good blues. Some of the larkspurs are perhaps the nearest approach to it.

For lower-growing and less gross mass-displays the following are good: California poppies for

Horned poppy (Glaucium luteum). Sometimes grown as an annual oranges and yellows; sweet sultans for purples, whites and pale yellows; petunias for purples, violets and whites; larkspurs for blues and violets; bachelor's-buttons (or cornflowers) for blues; calliopsis and coreopsis and calendulas for yellows; gaillardias for red-yellows; China asters for many colors except yellow.

For still less robustness, good mass-displays can be made with the following: Alyssums and candytufts for whites; phloxes for whites and various pinks and reds; lobelias and browallias for blues; pinks for whites and various shades of pink; stocks for whites and reds and dull blues; wallflowers for brown-yellows; verbenas for many colours.

Some of the common annuals do not lend themselves well to mass-displays. They are of interest because of peculiar foliage, odd or unusual flowers, special uses, and the like. Of such are portulacas (for hot, sunny places), balsams, cockscombs, poppies (the blooming period is short), pansies, dwarf convolvuluses and dwarf nasturtiums, snapdragons, amaranths, four-o'clocks, mignonettes, alonsoas, schizanthus, nolanas, argemone, horned poppy, and many others.

I should never consider a garden of pleasant annual flowers to be complete that did not contain some of the "everlastings," or immortelles. These "paper flowers" are always interesting to children. I do not care for them for the making of "dry bouquets," but for their interest as a part of a garden. The colours are bright, the blooms hold long on the plant, and most of the kinds are very easy to grow. My favourite groups are the different kinds of xeranthemums and helichrysums. The gomphrenas, with clover-like heads (sometimes known as bachelor's-buttons), are good old favourites. Rhodanthes and ammobiums are also good.

Among the ornamental annual grasses, I have had most satisfaction with the brizas, coix or Job's tears, and some of the species of agrostis and eragrostis.

Some of the perennials and biennials can be treated as annuals if they are started very early indoors. A number of the very late-flowering annuals should also be started indoors for best success in the northern States, as, for example, the moonflowers and the tall-growing kinds of cosmos.

If flowers of any annual are wanted extra early, the seeds should be started indoors. It is not necessary to have a greenhouse for this purpose, although best results are to be expected with such a building. The seeds may be sown in boxes, and these boxes then placed in a sheltered position on the warm side of a building. At night they can be covered with boards or matting. In very cold "spells" the boxes should be brought inside. In this simple way seeds may often be started one to three weeks ahead of the time when they can be sown in the open garden. Moreover, the plants are likely to receive better care in these boxes, and therefore to grow more rapidly. Of course, if still earlier results are desired, the seeds should be sown in the kitchen, hotbed, coldframe, or in a greenhouse if accessible.

In starting plants ahead of the season, be careful not to use too deep boxes. The gardener's "flat" may be taken as a suggestion. Three inches of earth is sufficient, and in some cases (as when the plants are started late) half this depth is enough.

Of late years there has been a strong movement to introduce the hardy perennials into general cultivation. This is certainly to be encouraged everywhere, since it adds a feeling of permanency and purposefulness that is needed in American gardens. Yet I should be sorry if this movement were to obscure the importance of the annuals. We need this colour and variety.

Mexican poppy—Argemone Mexicana

How to Get Early Flowers

By Sarah Hopkins

Several years ago I found myself too much of an invalid to be out in the garden sowing seeds, and with no one at my service who, in my opinion, could be trusted to do it for me. A summer without flowers was too dreary a prospect to be contemplated. This was long before I had learned the value of hardy perennials, and depended almost wholly upon annuals for flowers. Necessity thus set me to inventing, and I had my garden of flowers after all.

I secured a half-dozen wooden boxes about the size of common soap-boxes and had them sawed so that they were each four inches deep. These boxes were so small that when filled with soil they could be easily lifted about. I had the boxes filled with soil from the garden; and now imagine my comfort as I sat at a table sowing my seeds! There were no cramped limbs and aching back, as was usually the case when I had sowed my seeds in the seed-bed.

I find by consulting my "notes" of that year that I sowed the seeds April 9th. They came up quickly and far more satisfactorily than seeds sown in the garden. But to say that this first attempt to grow seedlings of annuals in the house was a perfect success would not be exact truth. Nevertheless, I had that year as fine a display of annuals as I ever had when the seeds were sown in the garden, in spite of the fact that the weather did not get warm enough for it to be prudent for an invalid to sit on the ground to transplant them until between June 9th and June 16th. Although this late transplanting was exceedingly harmful to their growth, they began to come into bloom the first of July.

I was so well satisfied with the experiment that I have repeated it every year since. The method has merits sufficient to recommend it to any one who does not have a hotbed to grow seedlings in. It is so late when seeds can be sown in the garden up here in Maine that by the time annuals grown in this way come into full bloom they are killed by frosts.

Instead of giving the details of my first experiment, I will give my method of later years, which will be of more value from having been perfected through past mistakes. I have studied to avoid all unnecessary work, and a plant-table lined with zinc has proved a great saving of labour,

Our grandmother's four-o'clock set in a good place

as the seeds and seedlings may be watered without being carried to the sink and without any drip upon the floor. A plant-table four feet long and two and one-half feet wide would afford sufficient capacity for growing seedlings enough to fill two hundred square feet of beds. Tables or rough boxes are rather unsightly objects, and I keep them in the kitchen until the weather will permit keeping them in a more out-of-the-way place.

I find that the time the seeds should be sown depends upon the time the seedlings can be transplanted to the garden. If one's health will permit the transplanting of seedlings as early as it would be warm enough for them, about April 6th would be the right time for sowing in New England; an earlier date would not be at all advisable. My experience has shown me that five weeks from the time of sowing the seeds is as long as the seedlings can be kept in the boxes without injury; the roots fill the soil, their growth is stopped and they become stunted, never making the fine plants they would had they been transplanted at the proper time.

I use soil just as it is taken from the garden, as the addition of fertiliser causes an unhealthy growth. I aim for a slow, sturdy growth. The soil is heated very hot in the oven to kill the weed seeds. The first year I failed to do this, and found weed-pulling made too much of an upheaval among seeds and tiny plants. I sow the seeds in rows an inch and a half apart, and three-fourths of an inch apart in the row to allow for some of the seeds failing to germinate. When I am sure that the last seed that will grow has made its appearance above ground, I thin the seedlings out to an inch and a half in the row. I find it necessary to allow this space, as the plants soon become crowded with less, and thinning them out then will disturb the roots of those which are to remain.

A sweet pea garden near Springfield, Mass.

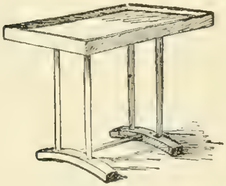
When the seeds are sown I place the table in a sunny window and give the earth the treatment required as regards light and sunshine, that it may be ready for them the moment they break through the earth. I keep them as close to the glass as possible, and roll the shades high. The first year I thought this unimportant when the seeds were coming up, and before

I knew it some of them were shooting up in the air more than an inch, though still encased in the seed-shells, and by the time the seed-lobes were freed they were carried an inch and a half high. Since then I give all the light and sunshine possible from the moment I discover the first seed breaking the soil, and thus keep the seed-lobes as close to the soil as possible. An abundance of sunshine and strong light is a necessity, for without these the seedlings become long-drawn and leggy and have no strength to stand upright.

In a mild spring I find it advisable to remove the seedlings to a room where there is no artificial heat, as the two greatest drawbacks to growing annuals in the house are excessive heat and shade. I soon begin to give them air during the warmest part of the day by opening the windows or setting them in an open door where the sun will shine upon them. After a short time I set them on a sunny piazza any sheltered place would do—during the middle of the day, then soon put them out in the morning, taking them in at night. As soon as all danger of freezing is past I let them remain out day and night, only taking them in from beating rain. The plants are not properly hardened off ready for transplanting until they have had full exposure to wind and sun; and they should be set by the beds where they are to be planted out a few days previous to taking them out of the boxes.

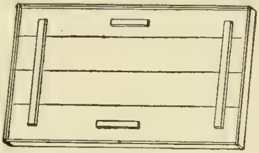
In starting any kind of plants from seed indoors in early spring it is important to have the seed-boxes in a handy place where one cannot help seeing them many times a day. If a seed-box is put out doors on the porch, the soil will dry out before you realise it and the tender seedlings will be checked or ruined. It is very fascinating to watch the growth of seedlings.

In growing annual flowers I always get the best results from sowing seeds in boxes indoors about fifty days before the soil outside is in perfect condition, and for this purpose I use a plant-table, which is a great convenience. It is a home-made affair which any one can duplicate at a small expense and which will soon prove to be an indispensable convenience. Plants can be watered on such a table with no drip upon the carpet, and if sand is filled in around the pots and kept moist it will be found an excellent way of supplying that moisture to the air which plants must have in order to flourish. The most valuable as well as essential feature of the plant-table is a zinc-lined false top. Almost any stout table of suitable size will do as

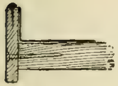


A plant-table for holding boxes of seedlings a basis, but in this case an old-fashioned "lamp stand" was used that we happened to have in the attic.

My husband, who makes no pretense to being a carpenter, fitted a large top to this stand which can be removed by simply lifting it up. For material he used what he could pick up about the place, which happened to be a spruce board an inch thick and a basswood board one-half inch thick. He sawed the spruce board into pieces three feet four and a half inches long. These he placed side by side with the planed side up, and they measured, as thus placed together, two feet and one-half inch across; then he secured them in place by nailing a cleat half an inch thick and one foot nine inches long and two inches wide at each end. These cleats were nailed at equal distances from the ends and two feet and eight inches apart, measuring from the inner side of each cleat. The cleats were nailed on the side to be placed down upon the top of the stand, and being put the same distance apart as the top of the stand was long, the top of the stand would thus fit in closely between them, giving no chance for the false top to move back and forth lengthwise. A narrow cleat about four inches long was nailed at each side of the false top the same distance apart as the real top of the stand was wide, and thus the false top was held from moving about either way. These cleats at the ends and sides of the false top were placed close enough together so that, when it was placed in position, it was necessary to exert a little strength in order to force it completely down upon the top of the stand, and it was thus held so firmly in position that it could never become displaced. Around the edge of the false top strips of the half-inch basswood three inches wide were nailed. These strips were placed below the inch board of the false top one-half inch, to hide from view the top of the stand. This made the false top boxlike, an inch and a half deep measuring from the inside. The bottom and sides of this were lined with zinc, which we did ourselves, the zinc costing from forty to sixty cents. It was somewhat difficult to fold the zinc at the corners without breaking it, as was necessary to make it water-tight. An easier way, and one that would have made nicer work, would have been to cut an inch and a half square from each corner, and then solder the edges together to make the corners tight.

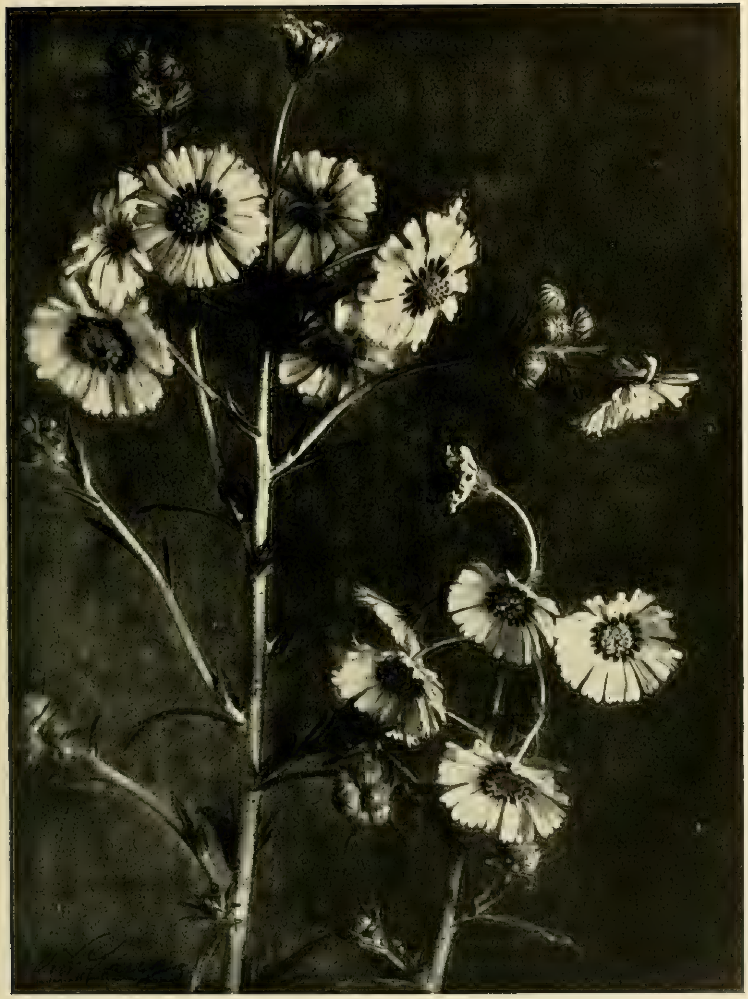


Under side of zinc top, showing cleats



The zinc was tacked along the edge at the top of the basswood sides with large tacks.

The stand and the basswood sides of the false top were treated with a coat of walnut stain and varnish, and as the legs and rod of the stand were quite prettily turned, my plant-table made a very fair appearance in the sitting-room.



Madia elegans, yellow, with a brown eye. The flowers close in the sunshine, but open in the morning and evening

CHAPTER II. PERENNIALS

I. Some Lessons from the Pan-American Exposition

By L. H. Bailey

AN HERB is a plant that dies to the ground in winter, and a border is a strip of planting skirting the boundaries of a place or lying along the walks or drives. We grow herbs because we like them. We make borders of them because they look better in such places, are more easily cared for, and are not under foot. A pigweed in the middle of the lawn is lonesome and a nuisance; or if we pull it up we have nothing to put in the hole. A pigweed in the border is happy and attractive; or if we do not like it and pull it up, there are other plants of its height and size to take its place. Anybody can make a border. It is a simple matter. But just because it is so simple and easy, there are few men who make attractive ones. Some of the best that we have had the privilege of seeing were on the Pan-American grounds. Probably few of the visitors to the exposition made more than a casual note of the herbaceous planting at the south end of the grounds, or thought of the care that had been expended there. Twenty acres were devoted to these beds. There were fifty exhibitors and more than two hundred plats. The difficulties are great in such plantings as these. The land is newly prepared. The time is short. There are few plants of a great many kinds. Each plant is to be an exhibit, and must therefore have opportunity to display itself. Exhibition planting is difficult to manage in an artistic way. If each plant is isolated, the mass-effect is lost and the plantation is likely to be a mere nursery.

The two pictures shown on pages 27 and 31 illustrate bold and artistic effects produced with exhibition plants, and there were many other examples as good as these on the exposition grounds. These plantings were the work of William Scott, Superintendent of Floriculture, and a florist of Buffalo. Mr. Scott has been known chiefly as a florist. We shall now think of him also as a gardener—in the broader sense—and as an artist in dealing with plants He had the great advantage of knowing how to grow the things.

We often seem to lose sight of the importance of such knowledge. It is knowledge that it is troublesome not to have.

Fourteen months before these things were planted the land had been only roughly graded. New soil had to be carted on, the final grading and levelling done, and the sod established. The home-maker, with good soil and established lawn, should be able to do at least as well.

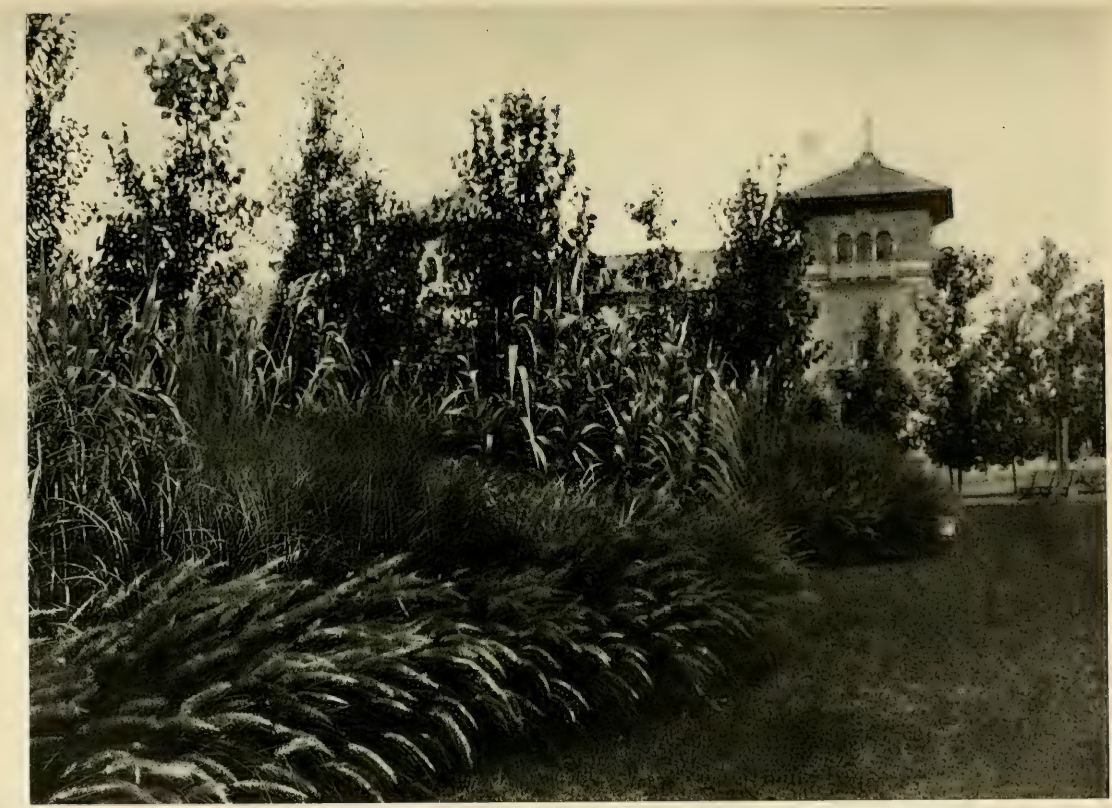
It is well to plan in the fall for the spring planting. Things always go slower than we expect. Spring will soon be here. If the ground is not yet frozen the earth can be spaded or plowed. Let it lie loose and open: the frost will pulverise it. Weathering is sometimes an efficient means of tilling. Unless the land is already rich, and contains much vegetable matter or humus, it is well to turn under manure when you prepare the land this winter. This manure may be very useful in preventing hard clay soils from cementing by the action of frost and rain as well as in affording plant-food. Even in some of the northern States hardy bushes may be planted in December, but it is usually better to wait until spring. Large specimens are often moved in the dead of winter because heavy balls of earth can be taken with them. Read the catalogues, and be ready to order your plants before the spring begins.

II. How to Make a Border

By F. W. Barclay

Plant thickly enough to form eventually a mass of foliage sufficiently dense to completely hide the ground. Scattered plants about a newly raked bed may look neat, but so would perfect rows of painted stakes. Neatness can be more perfectly attained by the close grouping of plants of similar foliage. Too great a mixture of leaf-forms and colours often gives a tangled and untidy effect. The aim is the happy medium between the sameness of a too large group of one species and the careless mixture of many species. Make the groups decided enough to be called groups in comparison with the area of the planting, but let them be irregular and blend into the surrounding groupings with pleasing contrasts.

A very effective way of planting, especially where the border is long, is to use a large quantity of a few kinds of plants which follow each other in bloom through the season, and to plant the whole border in small groups,



A fine bed of grasses at the Pan-American. The giant reed is in the background (Arundo Donax); in the middle are eulalias (properly, Miscanthus); the plumy grass in front is known to gardeners as Pennisetum longistylum

so that at one time the entire border appears attractive with flowers of one kind and of one or perhaps two colours, to be followed by a flower of another colour. This method changes the colour effect of the whole border almost every week, but it of course cannot give the effect of a solid mass of flowers, as would be the case if the same list were planted, each kind in a plot by itself. A list for this purpose to follow each other quite closely through the summer might be: Yellow daffodils, purple German iris, rose and white peonies, scarlet Oriental poppies, Japanese iris (white, with pencillings of colour), yellow day-lilies, monardas (red), phlox (white, or nearly so), rudbeckias (yellow), purple New England aster, and hardy pompon chrysanthemum (pink and white). If a larger list, with plants of several colours appearing at the same season is used, the effect is entirely different, and care will be needed to obtain the more pleasing contrasts of colour.

The preparation of the beds for perennials should be very thorough, especially as the soil cannot be deeply dug or greatly enriched afterward. If the subsoil does not provide sufficient drainage to prevent water staying on the surface of the ground or the soil from becoming excessively wet during the rainier seasons, then under-drainage to a depth of at least two and a half feet will be necessary.

The crown imperial, an old time garden favourite, which comes up with a rush in early spring

A first-class perennial bed, suited to sustain a large variety of plants in vigorous growth, should have the ground made loose to a depth of two feet. It would be best to have the entire two feet made up of surface soil, but it is not necessary. A satisfactory method is to throw off the surface soil and then dig over the subsoil and mix with it a fair amount of manure, bone and wood ashes. If the soil is clayey or sour there is nothing better than screened coal ashes to make its condition satisfactory. An application two inches deep to a foot of soil will loosen a stiff clay, and it will stay loose. Sand will answer to the same end, but not as well.

The top soil should, if possible, be a good loam, and be at least one foot deep. It should be well enriched with well-rotted manure, bone and wood ashes, or other mineral fertilisers, and put in a finely pulverised condition. The growth of vegetation cannot be vigorous without a deep, rich, well-drained soil. Keep the surface soil rich, and do not get part of the subsoil mixed with it, as many of the garden plants are shallow-rooted and need a very mellow soil; and further, a good friable surface is needed to allow the growth of annuals and small plants, especially those raised from seed. A good depth of soil gives a lower feeding-room for the strong-rooted plants, and allows the growth of more shallow-rooted plants among them, with far better results than could possibly be obtained on a thin soil.

An example of companion crops in floriculture—peonies and Lilium superbum

When purchasing plants for a border, take pains to obtain good, healthy stock, and see that it is carefully planted as soon as received. The best season to transplant any particular plant is while it is yet dormant and

A mixed border at the Pan-American. The aster-like plants are Boltonians. In the background, rods of blazing star (Liatris) shoot out of the mass

just before its roots start to grow. Plants in general, and early flowering ones in particular, make considerable root growth in the fall. A good rule to follow is: Plant in the early fall those species that blossom before July, and in the spring those that bloom later in the year.

If it seems best to make the planting all at one time, then early fall will perhaps be the best season for the greatest number. Fall planting should be early, so that the plants can become established in the soil before freezing weather. It is of course quite possible to move plants at any season, but more care must be used.

A well-drained, deep soil under the plants is the first and best protection. Too much water in the soil and too weak a root system, with the alternate freezing and thawing, are the main reasons for the winter-killing of otherwise hardy plants. If the beds are given a dressing of short manure in the fall, just sufficient to cover the earth without smothering the crowns of the plants, it will prevent the too quick freezing and thawing.

Plants that are really tender to cold must be mulched to keep the frost from the roots. This can be accomplished with any material, such as straw, leaves, etc., that is open enough to form interior air spaces and so be a poor conductor of cold. It is well to place this material in heaps over

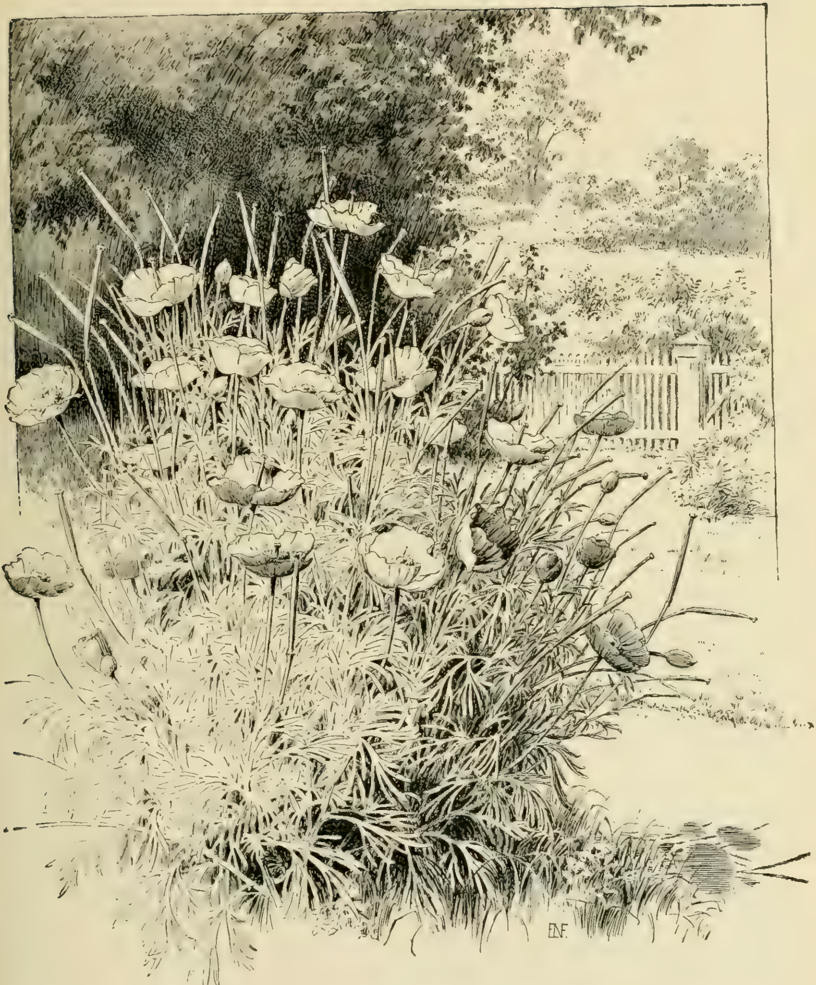
Shooting star, or Dodecatheon

the crowns of the plants so as to at least partly shed the rain. The soil must be extremely dry to injure an established dormant plant, but it can easily be too wet.

When, after a few years, the border becomes too thick or the clumps too large to give satisfactory flowers, some removal of plants and division of roots will be necessary. In general, do not separate the clumps until they show very plainly that they need it. The best season to divide any plant is the same as the best time to plant it, which is just before its roots start to grow

An effective border-planting against an office building

It may sometimes be best to water the border during severe drought. Do it this way, or do not do it at all: *Give to each square foot of the bed a two-inch covering of water as fast as the soil will take it up.* The continual application of a little water not only hinders the rise of water from the sub-soil, but tends to bring the roots to the moister surface, and so not only crowds them into a smaller feeding space, but makes the plants less able to endure the next drought, and less hardy for the winter.



The tulip-poppy (Hunnemannia), a Mexican plant allied to the California poppy

III. HARDY PERENNIALS FROM SEED

By Mrs. Hattie L. Knight

Two years ago, in the spring, I had a plot of ground running parallel with a fence plowed for a hardy border. It was dressed with barnyard manure, and harrowed and worked occasionally, so that last summer the ground was in excellent condition to receive the plants. I knew that to fill any border with such plants as I desired would cost seven or eight dollars (since divided plants from the nursery cost from fifteen to twenty-five cents each), while I found by consulting the catalogue that I could procure a packet of seeds of nearly all the sorts I most wanted for less than a dollar, including some good novelties.

I had grown greenhouse plants from seed, and knew that hardy perennials would be less difficult. So I procured the seed by May 24th, after the more urgent work in the garden had been done, and sowed them in shallow boxes, in rows an inch and a half apart and the same distance apart in the row, dropping them in singly. They were covered with soil to a depth of twice their diameter, and pressed down firmly. The top of the soil was moistened by applying the water with a whiskbroom; after this the soil was wet thoroughly two or three times in the same way, until it settled, and then the water was turned on carefully from a dipper.

The boxes were on a sunny piazza, and the soil was carefully watched that it might not become more than slightly dry. The seeds germinated well; none of the sorts failed to grow, with the solitary exception of a packet of platycodon, out of which one-third of the seeds failed; but, as it was, I had more plants than were needed. The seeds of a kind did not all appear together, some making their appearance ten days or more after the first ones broke the soil. The only care given the seedlings was to keep them from becoming excessively dry and to avoid applying water so freely as to keep the soil sodden.

The young plants grew vigorously, and when they became crowded were transplanted to temporary beds in the garden, which had been previously devoted to annuals, as these beds were more suitable than newly spaded greensward, being light and mellow, yet only moderately rich. The plants were set about eight inches apart, so that they would have sufficient room until they were to be permanently planted in September.

Double hollyhocks in a border of perennials

The hollyhock is biennial, but it is usually treated as a perennial, as it renews itself regularly from seed with a minimum of care

The experiment was so satisfactory that I do not hesitate to recommend it. Better plants can be secured with but little work, for only the largest and most vigorous plants will furnish the required number. This alone, if the saving of money is not considered, would recommend the plan, except when one is bent upon having a particular variety of phlox, iris or peony, or other species having many named varieties. Surplus plants are available for exchange among one's neighbours, or for sale if one is so inclined.

It so happened that the year I speak of I had old plants of iris, peony, phlox, ranunculus and bleeding heart, all of which I was able to propagate by dividing the clumps. I therefore bought only seven kinds of seeds: forget-me-nots, coreopsis, hibiscus, platycodon, ipomopsis, hardy carnation, and one other kind, the name of which I have forgotten. However, some of the best seed catalogues give a long list of kinds that are easily raised from seed, and some catalogues indicate the kinds which will bloom the first year from seed.

IV. OUR HARDY FLOWERS

BY ALICE M. RATHBONE

ROSES, lilies, daffydowndillies, and all the rest of the loved company of old-fashioned flowers, we count as our very good friends. Distinguished friends, too, are these of the hardy border, tracing their ancestry far into the misty past, and they are cultured to a degree. We find them fascinating from the time of the early spring greetings to the autumn farewells, when the brave dears are made ready with snug coverings for their long rest. What a pretty and comforting fancy about underground plant-life in winter is this of George Herbert's:

> "Flowers depart to see their Mother-root when they have blown,
> Where they together, alle the hard weather,
> Dead to the world, keep house alone."

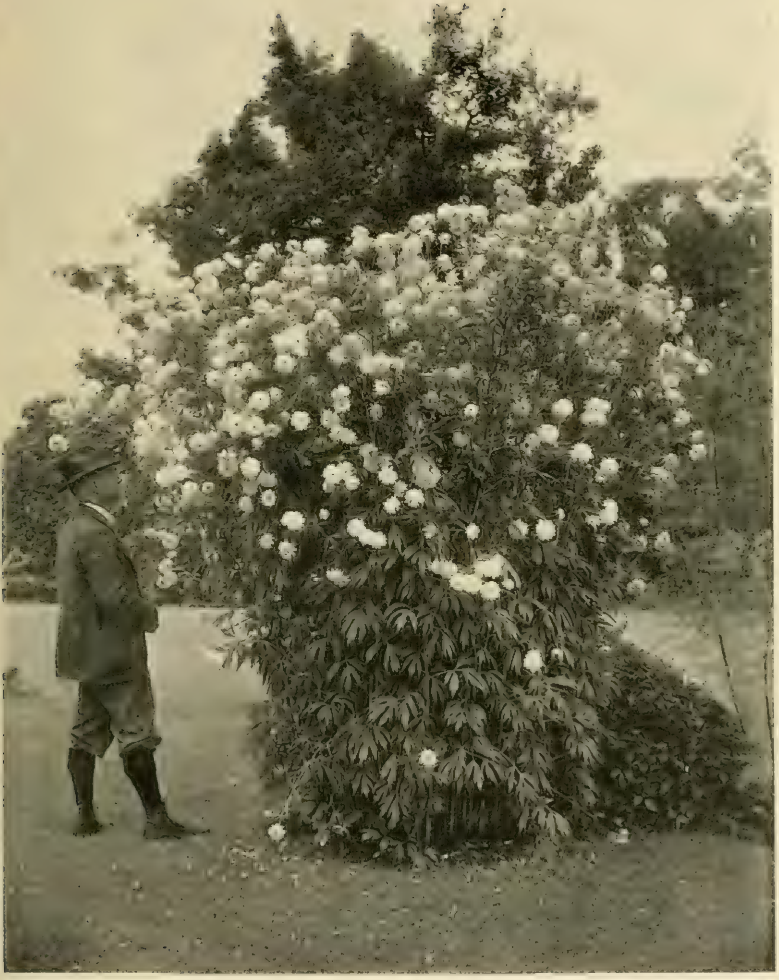
With the coming of March we begin to look eagerly for the snowdrop heralds to announce the approach of the procession. Stout of heart must be these delicate little heralds, that they should dare to "take the winds of March with beauty," like Shakespeare's stronger daffodils. Perhaps the remembered warmth of former welcomes helps them on.

The pleasure of one arrival is followed closely by another, until all the company, whose motto is "Perennial Friendship," has assembled, and the full delights of the season are at hand.

Arabis and *Alyssum saxatile* soon spread upon the ground their rugs of white and gold. The bulbs, having made preparations through the winter, are able to bring forward at short notice their delightfully fresh and joyous show of golden-chaliced crocuses, sweet hyacinths, blue scillas, jonquils, and other gladsome, springtime flowers of soft and tender hues; but when the tulips, bold and gay, are ready, then is the garden quite given over to a revel of colour. They hold up proudly their oriental goblets of richest hues, with a certain cavalier-like air doubtless acquired during their adventures in Holland, when they so nearly succeeded in taking that country from the Dutch.

The flash of the tulip display being over, gentle Iris comes with her messages from the gods to men, surrounded, while on earth, by the green lances of her guards. Iris certainly has most exquisite taste in dress. The costumes of this queenly messenger, who brings a period of repose and refinement to the border, are marvellous creations of rainbow-hued crêpe, chiffon, plush, and rare laces, brightened by a few rich adornments of gold. The opalescent tints are favourites of hers, and charmingly does she use them, sometimes with gold lacings. Always is she a vision of loveliness.

When the peonies follow, they seem, in their turn, to dominate the garden, as they spread for us a feast of colour ranging from creamy white, through luscious pinks, to deep, restful crimsons. What opulence of bloom is theirs! The modern peony is, we hope, too truly cultured to be hurt by an allusion to that branch of its family known to our grandmothers as "piny." Quite inferior were they to the peony beauties of to-day, but very dear to grandmother, along with her sweet-williams, lilacs and artemisias. Early in the last century Jane Austen wrote from their Chawton home to her sister Cassandra, "Our young piony at the foot of the fir tree has just bloomed, and looks very handsome." It must have had then, as now, that excellent plant virtue of presenting a good appearance. All the season through, from its first shining, bright-red shoots until cut down by frost, the peony contrives to look neat and respectable. Not so the hollyhock, however, poor fellow! He grows sadly rusty and seedy-looking before the summer is over, but he is one of the indispensables among the hardy flowers, nevertheless. How could we possibly get on without him? Whether single,



The "Golden Glow," a double form of our native Rudbeckia laciniata, one of the most successful perennials in cultivation

double or semi-double, or of what colour it matters little, so long as he is with us. In a well-ordered border they will appear in groups of separate colours, but in a fence corner, near a cottage door, or over a gray stone wall, how pretty they are with their hit-or-miss effect of colour. Groups of pure white hollyhocks, like groups of white foxglove, placed here and there among the brilliant hues around them, set off a garden wonderfully. This is true also of white phlox, even more useful, perhaps, because of its long-blooming season, which makes the perennial phlox of such value in the hardy garden. Masses of colour can be easily formed with them. Lovely shades of pink, with white ones for next-door neighbours and a touch of yellow not far away (given, perhaps, by hardy coreopsis or a helianthus of medium height), make the garden seem 'alle ful of freshe floures," like the Squire's embroidered dress, in "Canterbury Tales."

The study of colour effects is one of the various garden interests, and in working out our schemes the oriental rule for harmonising strong colours by the use of dividing lines of white, gold or black is a help, black being translated into some dull purplish hue for garden use.

Foxgloves in a border

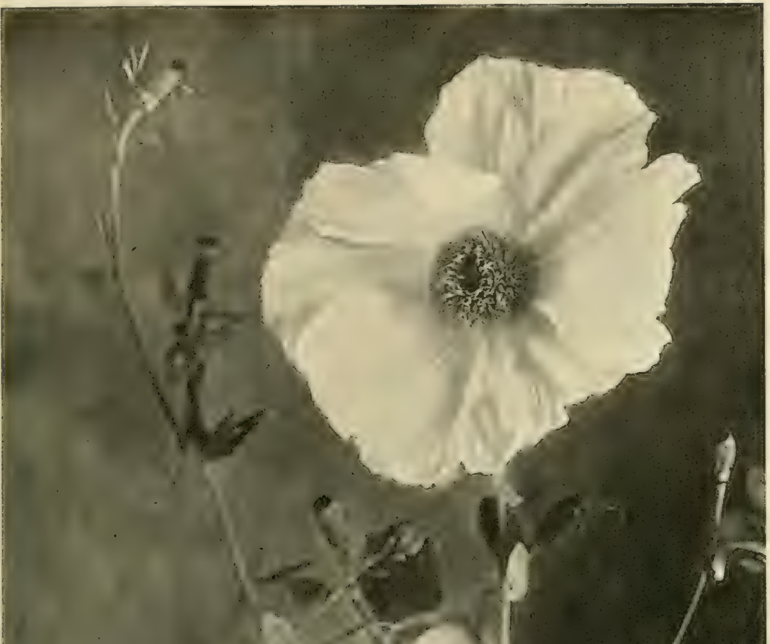
Nature shows her skill as an artist:

"When daisies pied, and violets blue,
And lady-smocks all silver white,
And cuckoo buds of yellow hue,
Do paint the meadows with delight."

But the gardener likes to take colour arrangement into his own hands, hoping to paint the garden with delight.

We put blue larkspurs near white lilies and fancy the border is never lovelier than in lily time, while the blue and the white hold sway there. And we find them far more interesting to "live up to" than the choicest of blue-and-white china. Yellow, as a harmoniser, offers itself on every side. It is necessary to guard against an over-supply. The advent among us of the popular golden glow has brought much cheer into the garden world, but its restless energy and push fill the owner of a moderate-sized border with utter dismay. One can believe it would become as lavishly in evidence as the sunshine if it were given its own way. But there comes a time, and that speedily, when its advance in the border must be checked, and new quarters found for the adventurous offshoots. Forced to expedients, we tried hitching a row of them to the barn by means of staples driven into the clapboards. This does away with the tall, strong stakes these rudbeckias demand in the garden because of their inordinate ambition to get up, as well as on, in the world. Apparently, the new situation suits them, and they

Shortia galacifolia, a rare and exquisite perennial discovered in 1788 and then lost for nearly one hundred years



The famous Matilija poppy of California—Romneya Coulteri. It is one of the showiest members of the poppy family, but only a very few persons have succeeded in raising it in the eastern States

rejoice in the drip from the eaves, by which they will probably be so much refreshed as to feel equal to extra exertions in their march over the earth. They make the north side of the barn sunny with generous yellow bloom, and they add much to the background of the border. That they add too much is all that lessens our gratitude. The strenuous life is theirs indeed, and their modern ways must greatly perplex their conservative neighbours of the old school, who, with their leisurely and dignified bearing, make the border of old perennials a restful place even when it is gay with brightest bloom.

White Day-Lily (Funkia)

And we like it to be restful, for the enjoyment of those associations in which there is much that borders on psychological ground. Can we be sure that the spirits of garden-lovers do not hover over other real garden-lovers' gardens, wherever they may be found? A fancy far pleasanter than that of the transmigration of souls through animal life would be the thought that those who have dearly loved certain flowers identify themselves, to the discerning sense, with their favourites forever. Perhaps; who knows? It is a bit of Celia Thaxter's vivid thought that comes to us from the poppies as they sway lightly in the breeze. And why is it that we feel such tender care of the low-growing things, the babies of the border? Is it not something more than plant life that looks up out of the blue eyes of the forget-me-not, the little violet faces, the sweet June pinks, and daisies? Over these garden pets we bend with something of the mother-love, to minister to their needs. Of Mrs. Ewing, too, we like to think while busy among the flowers. She, too, was fond of gardening, as well as of her garden, believing that a close acquaintance with the flower friends can best be had with little intervention from the professional gardener. How much we lost when Mrs. Ewing's charming "Letters from a Little Garden" were cut short by her death!

Hybrid Day-Lily (Hemerocalis "Florham")

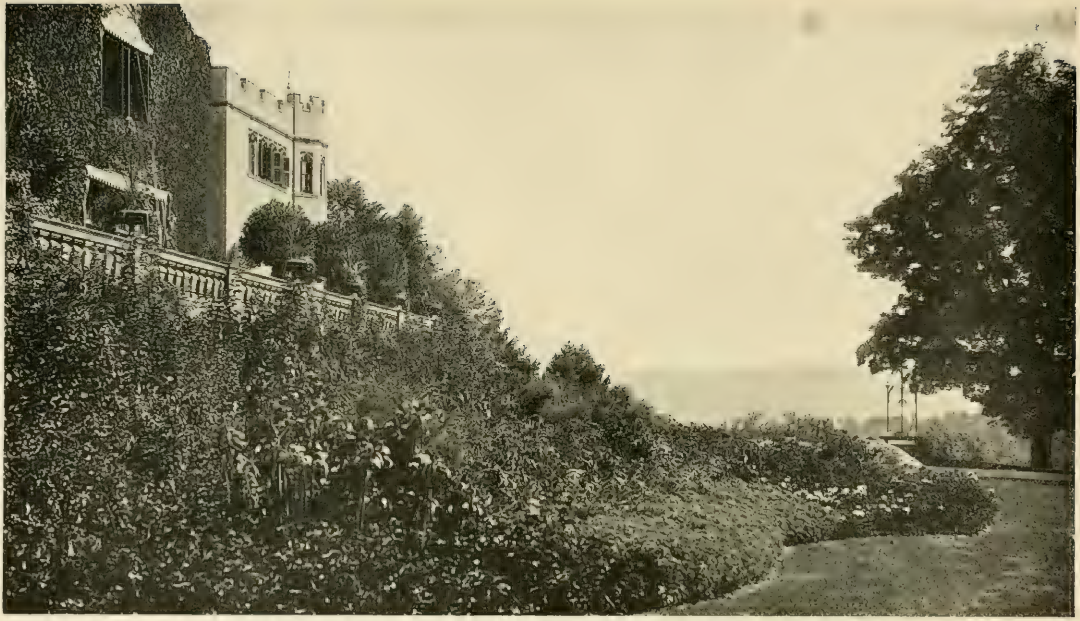
Another garden enthusiast, Miss Mitford, tells us what a pleasure it is "to have a flower in a friend's garden."

Gardens conduce to friendliness in many ways, and the exchange of roots, bulbs, seeds and flowers is one of them. Dear personal associations are rooted to the spot where grows "a flower from a friend's garden." It is as much of an event in the garden as in the social world when a new acquaintance is formed, and when a fine chrysanthemum root steps from a neighbour's garden into ours the campanula bells should ring for joy. We are fortunate in having garden campaniles that fall each autumn, only to rise again in the same likeness when summer comes again. Always to be associated with old-fashioned roses is the friend who appeared on the garden scene one October day with a bundle of plants in her arms. Like a fairy godmother seemed she when the bundle disclosed an assortment of roses from her own old garden, all duly labelled—damask, Scotch, seven sisters (a single rose which was traced back more than a century), "and a George the Fourth black rose, my dear, that your uncle gave me years ago." Happy is the garden that has a fairy godmother to bring it gifts like those roses!

Happy, too, ought to be that garden of the Nova Scotian who said she always meant to have thrift, honesty and abundance in her garden. Honesty is not often met with in gardens now, unfortunately. It is a most interesting thing to grow because of its beautiful oval seed-valves, made apparently of mother-of-pearl, set like an eye-glass in a delicate but firm rim. From the pleasure a bunch of these lustrous ornaments (one of the loveliest of Nature's devices in seed-pods) gives to elderly persons it would seem that it was more in favour formerly than now.

Hardy chrysanthemums are disappearing, like honesty, from the borders, discouraged, possibly, by the wonderful show-flowers of the florist. But it is a pity to let them go, for they are among the truest of the hardy friends, and, with Japanese anemones, keep up the cheer of the garden until winter is close upon us. There are several good ones among those still available—white, purest yellow, dark red, silvery pink, and all the dear little button kinds, mahogany-red among them.

There is one seemingly more precious, perhaps because elusive, that used to grow along a fence on an old village street, and was the object of a yearly autumn drive. The lovely flower was a loose white ball just tinged with purplish pink. It vanished several years ago from that Kinderhook



The herbaceous border in front of a house, showing careful planning as to the height of all the plants

garden. Doubtless it flourishes elsewhere. May its shadow never grow less until it reveals itself again to us in its beautiful old-time splendour.

Another neglected once-upon-a-time favourite is the Christmas rose. To look, on Christmas Eve, into a little hollow walled with snow, at its waxy blossoms, white, flushed with pink, is like looking down at the Bambino in an Italian church at Christmastide.

After all, there are but few among the dear old favourites that have grown out of our affections. Most of them have been loved down through the years by so many who have sounded their praises in poetry and prose that a wealth of association now surrounds them for those of whom it can be said—

A young hollyhock in spring, grown from seeds sown in a frame the previous August

> "In books and gardens thou hast placed aright
> Thy noble, innocent delight."

Literature has embraced the old-fashioned garden, and more and more in these days the garden gathers to itself an added charm from literature. We feel it with the primrose, the violet, and daffodil; the wallflower, whose unassuming blossoms send forth Old World memories as well as their own delightful fragrance; with the dainty columbine, and the foxglove, whose flower-stalk arrangement Ruskin likens unto the various stages of life—infancy at the top, old age withering away below. Tennyson speaks of "the foxglove spire."

Rich are we in these treasures, for the flowers that a well-stocked hardy border holds may be called the classics of the garden.

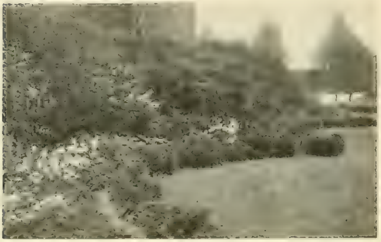
Compared with our short span of life, they belong to the Immortals.

Year after year "the same dear things lift up the same fair faces," and we would gladly become perennial, far beyond the limit of our threescore years and ten, to longer enjoy our hardy flower friends.

V. Scattered Planting vs. Masses

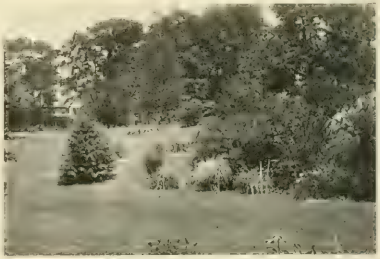
By "M."

The first of the accompanying illustrations shows one of the fundamental conceptions in landscape gardening, namely, mass planting as opposed to the indiscriminate scattering of individual plants. In the second photograph one sees a large number of rare and costly plants. The mind wanders from one detail to another; the whole effect is distracting and bewildering. There are many plants, but there is no picture. The question of what to plant is of secondary importance to the question of how to plant.



Example of massed planting

The first picture is characterised by simplicity and strength. The mind grasps the whole scheme at once. The open lawn in the center is not cluttered with a miscellaneous and meaningless collection of curiosities. The lines of the border are free and gracefully flowing. Such a border requires very little care compared with the second one. It is composed of perfectly hardy trees and shrubs arranged in a nature-like manner. The border is full of colour, which is set off by a natural background of tree foliage. In the second picture we have only the interest of detail. There is no unity, no grouping, no massing of plants. The tender foliage plants are costly and ephemeral, while unsightly stakes are a poor substitute for robust, sturdy, self-supporting plants.



Example of scattered planting

CHAPTER III. SHRUBS AND SHRUBBERY

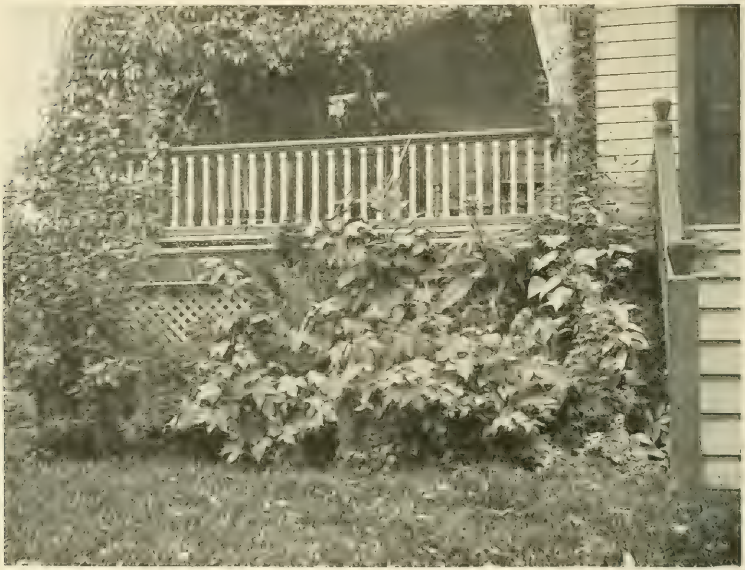
I. SHRUBS AND WHERE TO PUT THEM

By L. H. Bailey

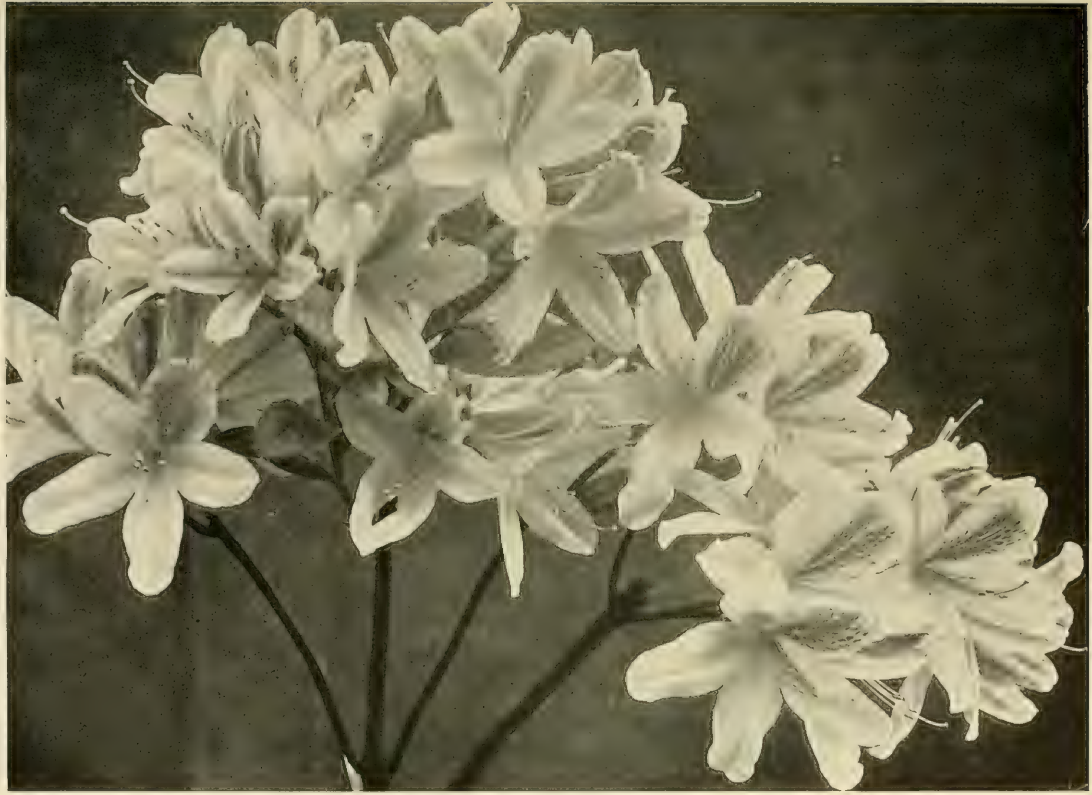
THE growth of the appreciation of shrubbery is one of the significant notes of the time. Every one likes trees and is willing to plant them, but the regard for shrubs seems to be a later development. This is well illustrated in many of the fine old estates, in which there are trees of magnificent proportions but a great dearth of plants of lower growth. This former lack of appreciation of shrubbery is all the more singular from the fact that the beauty of our common native landscapes often depends quite as much on the shrubs as on the trees. I suppose that the mere smallness of the shrubs causes them to appear to be trivial and little worth the while. We have undergone a similar evolution in fruit-

Clump of one of the wild roses, showing good shrub-effects as well as good bloom growing. Our early pomology is concerned mostly with tree fruits—apples, pears, cherries, peaches, plums. The bush-fruit industry is really a development of the last fifty years; and even yet there are many good fruit-growers who will not "bother" with berries.

The marked advance in the appreciation of shrubs is probably due to two general agencies—to our growing intimacy with the particular objects in nature, and to the teaching by the landscape gardeners. We are caring more for things afield. We even start agitations to preserve the wild flowers and animals from destruction. Every year we are transferring greater numbers of the wild plants to our gardens. Our appreciation of nature is becoming closer and more particular. I believe that we have lost nothing of appreciation in the large; but we have certainly added a more specific understanding of the details. From the art side, we are aware that our canons of taste are changing. The old idea of the grove as a proper concep-



Ugly corners and bare lattice-work screened with wild bushes and herbs



Truss of Azalea mollis flowers

tion for the home area has given place to the idea of a picture; and, in a landscape picture, trees are not the only elements of interest, any more than they are in a picture on canvas. The shrubs are needed for the intermediate tones.

Before discussing the kinds of shrubs, it is important that we understand why we use shrubs. The largest use of shrubs is as a part of the general composition. The old books said much about the sky-line made by the tops of trees. In places of ordinary dimensions, however, it is more important to consider the ground-line. The ordinary line of vision should often be arrested at the boundaries of the place, else the place looks bare, indefinite and unfurnished.

A good treatment of sumac, planted against a background, and cut to the ground now and then in order to force a vigorous new growth

The proper disposition of shrubs breaks the monotonous ground-line and sets limits to the place. Shrubbery also introduces great variety of form and colour and texture, and it relieves the tameness and openness of mere tree-planted areas. It enhances the intimacy of our relations with the planting, since shrubs grow to the height of one's eyes; whereas trees grow far above us, and most herbs are far below us.

Aside from these general considerations, shrubbery has specific uses. It affords a most excellent and quick-growing screen to cut off undesirable objects. Thus, a thick planting of shrubs may screen a chicken-yard, a clothes-yard, a neighbour's premises, the kitchen door, the vegetable garden, the rear fence, the children's playground. It may afford a good cover for high and bare foundations, serving to tie the house to the greensward. It may cover rough and intractable areas, as rocky places. It may hold banks from washing. It is useful for filling all odd and unmanageable corners, as the corners by the steps and in the wall. It may be made to cover naked and unsightly places under trees and under wide eaves. Nearly every important group of trees should have more or less shrubbery at its base. Compare the tree-groups that please you in the parks with those that do not, and see whether shrubbery does not enter into the composition of the former. Observe the treatment of the roadsides in modern parks. Why is the old fence-row so attractive?

If the reader has been patient enough to follow me thus far, he will understand how very difficult it is for any one to give general advice on the kinds of shrubs to plant. The shrubs must suit the objects for which they are to be grown, and must adapt themselves to the particular conditions. The questioner must first analyse his subject; then the question may answer itself. If you are wholly at sea as to what you want to do, call in a landscape gardener. Do not think that because your place is small you want a small landscape gardener. Often the most difficult questions are those concerned with small areas. Get good advice, or else take your own. If you know what you want as to effects, but are unacquainted with the kinds of shrubs to produce these effects, again take advice, and be willing to pay for it. Ask some competent landscape gardener or some reliable nurseryman what shrubs will thrive, for example, in shady places in your climate, what ones will bloom in July, what ones will grow in wet places, and the like. Perhaps there is a park nearby to which you can go to see the kinds of shrubs. The superintendent or some other officer will be glad to tell you what they are and what they are good for, and to answer any other intelligent question. This is one of the things that parks are for—to afford information to the intending planter, as well as to be things of beauty in themselves.

My own predilections are for the native shrubs—for those, I mean,

The pond in rhododendron time

that grow wild in my neighbourhood. They are usually "easy" to grow, requiring no extra trouble: perhaps this is the source of my interest in them. Then, if planted freely, they make the place a part of the region in which it is. We are content only when we appreciate the region in which we live. Where hobble-bush is the commonest bush, hobble-bush should be to us the best bush. It is often said that the native bushes are cheapest, but I doubt this. I can buy Japanese shrubs at the nursery one hundred miles away, and have them shipped to me, at a total cost considerably less than that incurred when I search the woods for dockmackie and good wild roses—providing, of course, my time is worth anything. But then, how could I spend my time more entertainingly?

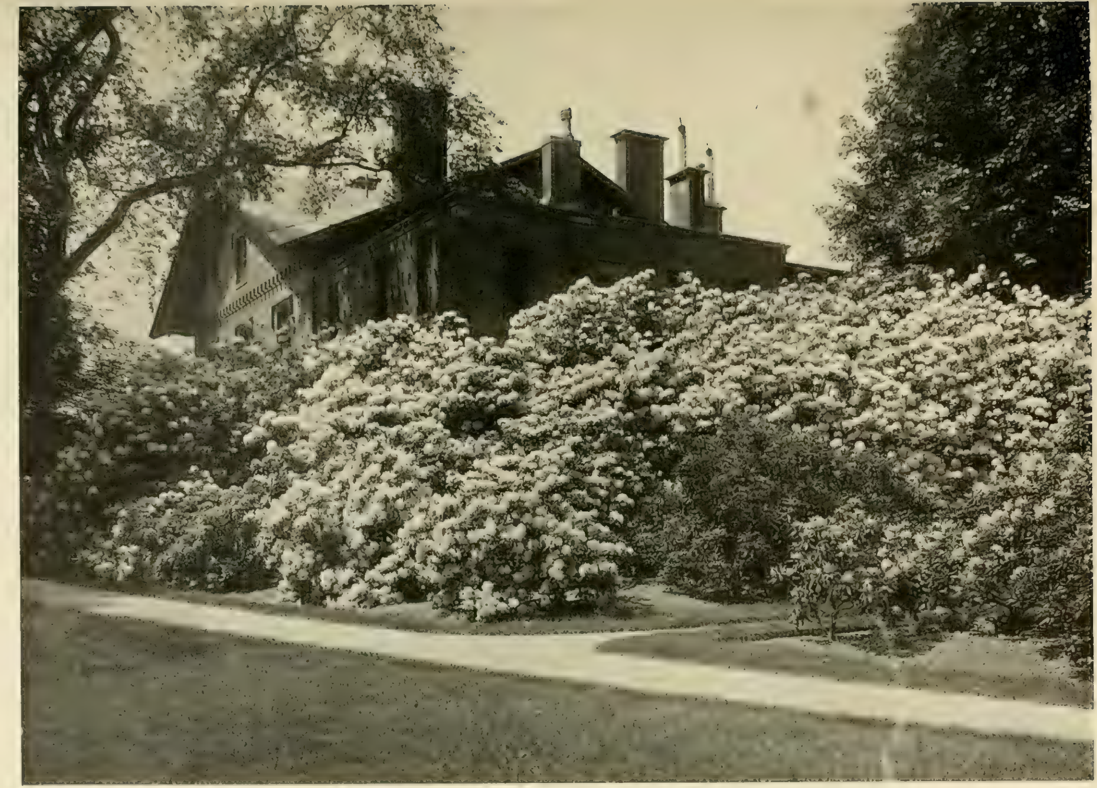
Of course, I should not plant exclusively of the natives; and if none of the natives seemed to fit the conditions and requirements, then I should have none of them. But, at all events, I should make the main body of my shrubbery of staple, hardy, easily grown kinds. Then I am sure that I am making no experiment and taking no risks. The fancy and capricious kinds I should use sparingly; then if they fail I still have my main plantations left. The list of the reliable and hardy kinds for central New York is really a long one. I should include in it lilacs, mock-orange or philadelphus, spireas, deutzias, rugosa roses, Tartarian and other bush honeysuckle, privets, elders, Japanese snowball (the old-fashioned one is too much infested with plant-lice), viburnums, barberries, Japanese quince, several willows, chokecherry, flowering currant, dogwoods (cornus) weigelas, hazels, symphoricarpuses, sumacs. These I should call good general-purpose shrubs, and suitable for the main effect in planting.

Most other shrubs I should consider to be special-purpose kinds in central New York. For example, the big-trussed hydrangea is a special-purpose object. Perhaps no shrub is planted with so little taste as this. The idea seems to be that it must be planted, but that it is immaterial where it is planted. Oftenest it is made to spoil a good lawn by having it thrust in here and there without relation to method, purpose or design. It reminds me of the old lady who came into possession of some doors when a neighbouring church-building was pulled down. Of course, she must use the doors: therefore, she set posts in her garden and hung the doors between.

This brings up the whole question of what to do with very showy plants like the hydrangea. It is perfectly legitimate to have them, but their disposition should have some relation to the place itself. I am perfectly sure that they should not be scattered here and there. They show to best advantage against a background of foliage. The best effects usually are secured when they are planted in front of heavy shrub-masses. They then have some connection with the construction lines of the place, and they are far enough removed from the other shrubs to allow them to develop into their full individuality. A long, sweeping line of them against a flowing background of taller and heavier growth also comports well, particularly if the place is somewhat florid in its character. It is always well, with whatever plant, to avoid the isolated, unrelated, single specimen in the middle of a greensward. Note how emphatic are the plants of sumac and mock-orange in the illustrations on pages 74 and 75, because they have a background

Azalea amoena, forming the terminus of a line of shrubbery

Deutzia gracilis, used for a border-mass



Hardy hybrid rhododendrons planted in 1869 at Jamaica Plain, Mass.

of good foliage. You would not put a pump in the center of your front yard: then why put a hydrangea there? The beauty of any planting will be enhanced by due consideration of the surrounding conditions of landscape.

The value of shrubbery really lies less in its bloom than in the foliage and the general character as to form and "habit." Many shrubs have merit in both flowers and foliage. Of such is the Japanese quince. In spring the bush is on fire with flowers; in summer, if the plant is not sheared, the habit and foliage are good. The forsythia, however, while excelling in early spring bloom, has a thin and sparse summer effect that lacks both strength and individuality. Therefore, it is well to make the forsythia an integral part of a shrubbery-mass, in order that its summer aspect may be blended with other foliage. Roses are rarely good for shrubbery effects. They are essentially flower-garden subjects, valued for their bloom alone. They do not produce their best bloom when massed with other shrubbery. Therefore, it is best to grow them in a place by themselves, and in rows, where they may receive the best of care. There are some exceptions to these remarks in the case of the Japanese rugosa rose and some of the natives; these may be good shrubs as well as good flower-bearers; but even in these the blooms are secondary.

The whole subject of purple-leaved, yellow-leaved, variegated-leaved and cut-leaved shrubs may be considered in this connection. These objects should always be mere incidents in a place. They are curiosities. When planted sparingly and near some shrubbery-mass, some of them give very pleasing effects, adding richness and

The swamp leucothoë (L. racemosa), a shrub with waxy white flowers

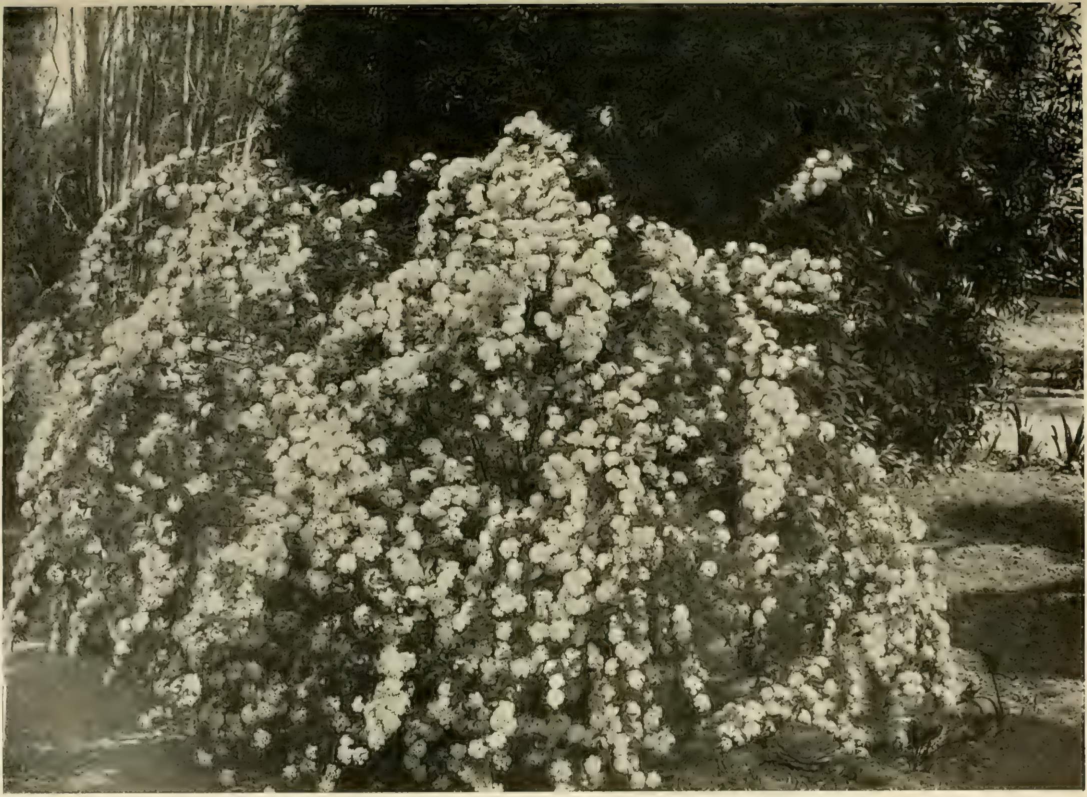
emphasis to the group; but it is always easy to use too many exclamation points.

The reprehensible practice of shearing shrubs should also be considered here. The beauty and interest of a shrub surely lie in its natural habit and form. When shrubs are sheared into formal shapes, the shrub no longer exists for itself, but is only a means of expressing some queer conceit of the shearer. Of course, shrubs should be pruned to make them healthy and vigorous, to keep them within bounds, to increase the size of bloom, and to check mere waywardness; but all this leaves the shrub a shrub, with the hand of the pruner unseen, and does not make it to counterfeit a bottle, or a barrel, or a parachute. If the forsythia has superlative merit, it is for the wealth of early spring bloom. Yet, I know a yard in which the forsythias are annually sheared into shapeless shapes, and this is done when they are in bloom. Last year two-thirds of the bloom was cut from these bushes when it was just opening, and the reply of the Irishman who barbered them, when I remonstrated, was, "Indade, they hev no shape."

The satisfaction in shrubs, as in any other plants, lies in their vigour and healthfulness. Make the ground rich before you plant them; or, if they are already planted, dress them in the fall with fine manure, and in spring apply a little chemical fertiliser. I like to prepare the shrub-border by spading it or plowing it deep, working in an abundance of good humus-making material, such as fine litter and old manure. This extra work pays exceedingly well in the end.

Plant thick—say two feet apart, unless the shrubs are very large to begin with. You want quick effects. The plantation can be thinned out later, and those plants that are removed can be planted elsewhere. Shrubs can be moved readily. Sometimes I remove certain shrubs frequently for several years, letting them do service in various places for a time. For a year or two, strong-growing annual herbs may be grown in the vacant or bare places; but if this is done, extra care must be taken with fertilising and watering, or the bushes will suffer. When the bushes are planted, they should be headed back severely, and this practice may need to be repeated for a year or two until the plants are thoroughly established; but after they are well under way, prune them only mildly.

As to fall or spring planting, one cannot give dogmatic advice. I usually prefer the spring, not knowing what the winter will do for the plants; but get them in early, so that they may establish themselves partly before



Spiraea Van Houttei one of the most floriferous of all shrubs, and useful also for its foliage and habit

the hot, dry weather comes. If the land is well prepared the preceding fall, much will be gained.

Always prepare to destroy the bugs and leaf-blights. Every place of any size—even a well-planted city lot—should now have a light spraying outfit. A little ammoniacal carbonate of copper can always be kept in stock in bottles, ready to be diluted, and to be used for fungous attacks; and hellebore or other poisons may be kept for the insects. Most shrubs will take care of themselves, to be sure; but this does not prove that good care on your part may not produce still better results.

II. How to Prune Shrubs

By William Falconer

We prune shrubs to regulate their growth and make them graceful, pretty bushes, to accentuate their natural character, to invigorate weak growth or check overluxuriance, or to increase the profusion or enhance the quality of their blossoms. We prune a privet hedge with a hedge-shears in a closely sheared, straight, artificial line or rounded form; but this sort of pruning in the case of spireas, deutzias, weigelas, mock-oranges and other garden favourites, grown in shrubbery-masses or as isolated specimens for beauty of form or blossoms, would be desecration.

All kinds of garden shrubs may be pruned between the times when the leaves drop off in late fall and before the buds start to burst into growth in earliest spring, but I do not like pruning in very frosty weather. A stout, sharp pocket-knife, as Saynor's pruning-knife, or a pair of seven-inch, eight-inch, or nine-inch spring pruning-shears, are the handiest implements for pruning; for cutting out the stoutest shoots and the bigger old wood a parrot-bill is excellent, or a pair of lopping shears with handles three feet long.

In pruning shrubs of any kind, have an eye to regulate the growth of the plant, and give it an easy, graceful, natural outline, always trying to keep the branches well down to the ground. Thin out old and gnarly stems and stunted or enfeebled wood, and endeavour to preserve a fair fullness of healthy shoots with plenty of firm, well-ripened spray twigs for flowers. In pruning twigs, always cut back close to an eye or joint, and in pruning branches, large or small, always cut close back to a joint or stem. Never leave a snag, and wherever you find an old snag cut it off close to the living wood. Never use hedge-shears on a shrub. We not infrequently see shrubs bare at the bottom and with tall stems and broad, spreading heads, but they are repugnant to the eye. When the shrubs begin to crowd each other in a bed, do not try to remedy matters by pruning; instead, thin the mass by removing a number of the bushes—dig them up carefully and plant elsewhere.

A bit of effective border planting

If any of your shrubs get infested with bark scale—lilacs, prunuses, euonymus, and some others frequently do—root them out bodily without hesitation, and burn them. Do not try to cure the shrubs by pruning off the infested limbs. I once had a big bed of rugosa roses infested with white scale, and in winter I cut off every plant down into the ground; the next spring, from the suckers in the earth, up there came a dense mass of young shoots, all perfectly clean.

The Chinese flowering crab, Pyrus floribunda, covered with its own rosy flowers

Avoid heavy cutting, hacking or pruning of shrubs at one time by timely and judicious pruning every year. In most cases, a very little pruning will be sufficient.

Among shrubs that need scarcely any pruning are azaleas, *Deutzia gracilis*, sweet fern (comptonia), wax myrtle, mezereon, ceanothus, tree peonies, shrub yellowroot, and Thunberg's spirea. On the other hand, shrubs that are benefited by being cut down to the ground every winter are callicarpa, *Desmodium penduliflorum* and *Japonicum*, the "blue spirea" (caryopteris), and the shrub-like perennial wild senna (*Cassia Marylandica*). Among the larger shrubs that severe annual pruning benefits are the great panicled hydrangea and the tamarixes. Cut the hydrangea back to its first or second joint and the heads of flowers will be much larger than they would be if more wood were left. The African tamarix blooms in May; cut it hard back as soon as it has done blooming, but never at any other time. The Chinese tamarix blossoms in August and September; cut it hard back in

A vista of hardy herbs, shrubs, and trees winter only. Some advise severe annual pruning for the althea, or Rose of Sharon; but I do not, for I do not admire a stumpy shrub. Keep it low-branched, but let the shoots get up and spread out. The pure white, single-flowered one is the prettiest of all, and it needs very little pruning.

Among our commonest garden shrubs are spireas, deutzias, mock-orange, weigelas, snowballs, lilacs, forsythias, magnolias, kerria, and sweet shrubs; and a word about these may suggest how to treat the others. Take Van Houtte's spirea: all it needs is occasional thinning out of the old wood; do not shorten the arching sprays. The crenata deutzias and mock-orange (generally known as syringa) shrubs are likely to grow very tall and full-branched from the bottom. Thin them well out from the base, and cut some of the tallest stems back half way, but do not shorten the side branches or well-ripened arching sprays. Lilacs, either the named varieties, Persian, Villosa, or the late-blooming tree species, as Pekinensis or Japonica, seldom need any pruning, except a watchfulness for suckers from the stocks on which they have been grafted: remove these as soon as seen. Weigelas

The woods as a background for informal borders of shrubbery and flowers. Cut-leaved staghorn sumach, Hydrangea hortensis, and Lilium testaceum

Philadelphus, known also as syringa and mock-orange. This is a good single specimen, standing in relation with a background. (The name syringa properly belongs, as a botanical term, to the lilacs)

need only thinning, and if they show a tendency to overluxuriance and sparsity of blossoms, cut in their roots in a deep circle three feet away from their stem. The Japanese snowballs need no pruning, but the common one gives much bigger blossoms from stout, vigorous young shoots than from twiggy old wood; therefore, keep cutting out considerable of the old wood and encouraging young.

Magnolias need no pruning aside from the timely shortening of a too far-reaching branch; but if they are likely to get bare at the bottom, tie down some of the lower branches close to the ground to fill up the space. Kerria and rhodotypus may get too thick; thin them a little, and from the bottom. Sweet-shrub needs only regulating, and, in the case of old plants, merely a shortening of the heavier branches.

Forsythias should be pruned just after their flowers are past. Cut them in rather hard.

Shrubs of doubtful hardiness, as some of the privets, Japanese red-bud, and styrax, should not be pruned until early spring; then all injury from winter can be cut out. Evergreen azaleas (amœna), leucothoë, kalmias and rhododendrons need no general pruning; but in the case of the rhododendrons that have been hurt by the winter, their injured branches should be cut hard back into sound wood, when a fresh growth may start from adventitious buds.

Roses may be pruned with comparative safety at any time in winter; but I never like to touch them until the winter is about over, because in some seasons, from tenderness of variety or injury to unripe wood, some kinds are likely to get hurt down to the snow-line. The H. P. or June roses we cut pretty low down; this gives us strong shoots and big flowers. Such as Madame Plantier we let grow into big bushes. The Crimson Rambler is let alone, and it repays us with immense wreaths of vivid blossoms. The prairie and all other running roses are simply thinned out, and not shortened back.

In the case of some of the finer Japanese shrubs, or small trees—for instance, the dwarf, vari-coloured maples, magnolias of the Watsoni and parviflora type, and pterostyrax—as they advance in years and get large, a branch, a big limb, or maybe half the plant, may die off in summer with a good deal of the appearance of fire-blight in pear trees. As soon as this is noticed, cut out these diseased limbs well below the affected parts.

III. HOME PROPAGATION OF SHRUBBERY

BY FRANK H. SWEET

QUITE a number of years ago my father bought from an agent a *Hydrangea paniculata grandiflora*, one of the finest of flowering shrubs. We did not know very much about shrubs at that time, but we liked them all, and were fond of experimenting. The second year, my father discovered that the hydrangea was much improved by severe pruning. It grew better, and the blossoms were much larger. Then he found out that if the cuttings were inserted in the ground any time before the leaves started in June they would root easily. He raised a large number of plants in this way. All of them blossomed the same season the cuttings were put in, and the second year they were large enough to transplant. They were set in a hedge, five or six feet apart, in front of the house. The land was rich and mellow, and they grew rapidly. At present the hedge is eight or ten feet high and presents a grand spectacle during August and September. From the road, especially in the evening, it looks like a big bank of snow. One year my father put in nearly two thousand cuttings, and very few of them failed to root. He has given away hundreds of plants to his neighbours, has sold several hundred dollars' worth, and has a thousand or more fine plants on his place. And yet he has not followed it as a business, has not advertised, and has done comparatively little work at it—a few hours in the spring and fall, putting in cuttings and transplanting as the shrubs became crowded.

Hydrangea—one of the most popular shrubs, and easily propagated at home

A neighbour has an acre or two of choice shrubs which he raised almost entirely from cuttings and divisions of plants that have been picked up here and there. He is a mechanic, and has only an occasional half-hour to spare for this work, and yet during the few years that he has owned this lot he has changed the barren hillside to a veritable garden of beauty. And I doubt if, outside of his work, it has cost him more than ten dollars.

Many of the cottage owners at Narragansett Pier—two miles away—

A sunny corner grown wild with lilacs

have hedges of California privet set around their grounds. These hedges are pruned two or three times during the summer, and the cuttings are usually thrown beside the road. Occasionally persons going by have picked them up and carried them home. At present, there are probably twenty-five or thirty fine hedges in the vicinity which are the direct result of these cuttings. If the owners had purchased the plants from a nursery the hedges would have cost from ten to twenty dollars each; as it is, they cost only a few hours' labour. Privet cuttings root easily, and at any time from spring to fall.

I have stated these facts merely to show how easy it is to acquire or increase shrubbery. Of course, not all plants increase with the same readiness. Some must be propagated by cuttings, some by layerings, some by grafting, and now and then there is one with which the amateur is sure to fail. But I venture to assert that, with the great majority of shrubs, the beginner will find but little difficulty. As a rule, I have found it best to insert the cuttings in the spring, before the buds have started. Most hardwood cuttings, if desired, may be prepared during the winter and placed in the cellar, to be ready to plant out as soon as the ground opens. Cover the bundles with a thin layer of soil, if the cuttings are to remain in the cellar for some time, to prevent drying. Hydrangeas and some other shrubs can be rooted as late as June. Willows and California privet will root any time during the summer.

Cuttings should be made from four to six inches in length, and if possible should be inserted in a moist piece of ground. They may be placed very close together in rows made just far enough apart to cultivate easily. At the end of the first year they will be large enough to transplant.

Another plant that bothered me at first was the hardy rose. I tried cuttings in the greenhouse and out, and in all seasons of the year, but met with indifferent success. At last I put cuttings in an old coldframe that was partly open to the weather. During the winter the frame was frequently half filled with snow, but the next spring I had a fine lot of thrifty young rose-bushes. If I had inserted the cuttings early in the spring, before the leaves started, I think they would have done just as well. A good plan would be to insert rose-cuttings between the rows of coldframe cabbage and cauliflower plants. It would save space, and both would come out in the best of condition for early transplanting.

These examples, I hope, will show that any one with patience and a little money can provide himself with choice shrubbery and plants; and there is a fascination in propagating plants that can be found in few other pursuits. I doubt if the merchant watches the market quotations with half the pleasurable interest that the propagator gives to the outcome of some of his experiments. Any boy or girl on a farm could have a small nursery in one corner of the garden. It would be a constant source of pleasure and instruction, and with little trouble could be made to yield a snug income.

CHAPTER IV. TREES FOR THE HOME GROUNDS

I. Flowering and Ornamental Trees

By O. C. Simonds

NO BOOK on floriculture can be complete without a chapter on trees. Some of the showiest flowers are borne on small trees which are suitable for gardens of moderate size. The foliage of trees and shrubs is indispensable as a background for flower borders. Trees make the sky-line—an important feature. They are often invaluable as windbreaks, and they supply shade and retain moisture—conditions which are essential to the life of some of our choicest flowers.

Who has not seen trees so profusely covered with bloom as to almost hide the branches and young leaves? Witness the plums and cherries, including those that come to us from Japan; thorn-apples, comprising the English hawthorne and the great number of American species, all varieties of crab-apples, and ornamental peaches. With them naturally go Japanese quinces, roses, and spireas. Many of the trees mentioned are ornamental in fruit as well as in flower. The Juneberry forms a connecting link between snowstorms and summer. Its pure white flowers often appear in contrast with those of the redbud. The flowering dogwood is another tree noted for its bloom. Some of the willows would be especially appropriate near a bog garden, their catkins and brightening bark frequently making the first announcement of spring, an announcement which is quick to be repeated in a different manner by the song-sparrow perched on one of its branches. Trees of a larger size noteworthy for their flowers are the red maples, the horse chestnut, the catalpa, the linden, and the locust. The sugar maple and Norway maple are also worthy of mention, on account of their yellow flowers, although these are not quite so rich in colour as those of the maple first mentioned. The flowers of some of the trees named are quite fragrant when in bloom. This is especially true of the common locusts and lindens. The tulip tree, with its large, glossy leaves of unique shape, is in full summer attire when the blossoms appear, and the latter are frequently unnoticed, although they are quite deserving of admiration. With the tulip tree should be mentioned the magnolias, although it must be remembered that there are many places in the United States where these do not thrive.

But trees noted for their blossoms are not the only ones that are suitable for planting about a flower garden. The flower garden that I have in mind is not one devoted exclusively to the raising of flowers which are to be cut for home decoration, and which should be planted in rows and beds for ease in cultivation, but is a garden arranged primarily to show a beautiful composition in which flowers appear to their best advantage, because they have

Late to appear are the tulips of the liriodendron a background of shrubs and trees. A single tulip appearing against the deep shade of a shrub or low-growing tree may be more beautiful than a bed, without any setting, that contains hundreds of plants. The same is true of a group of trilliums growing under a low-branching linden, or a showy lady's-slipper in the shade of a white pine. I have in mind a low-branched soft maple where the ground underneath is carpeted with wild violets; an elm about whose buttressed trunk is a thick growth of white adder-tongues, and a beech shading a beautiful group of ferns. One can imagine a beautiful fall picture where a pepperidge tree, which has quite inconspicuous flowers, but has an autumn foliage more brilliant than that of our other native trees, serves as a background for sunflowers, golden-rods, and asters. Such would indeed be a beautiful picture.

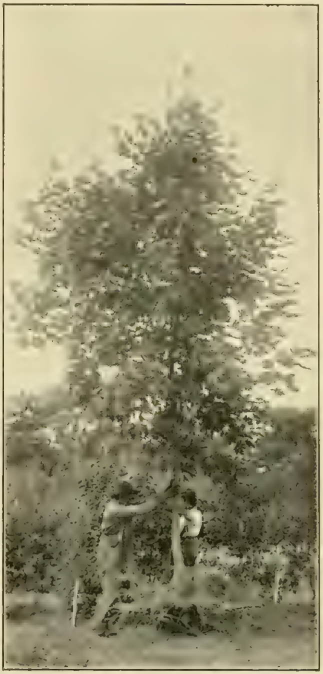
Examples of tree covered with showy flowers. Magnolia stellata; hardy in New England; blooms in April

The brilliant colouring which the foliage of certain trees takes on in autumn is usually more satisfactory than that of such trees as the purple-leaved plum and the purple-leaved beech, which retain their peculiar colouring during the entire season. Care should be taken not to use too many trees whose foliage is abnormal either in colour or shape. The leaves of our common trees present a wonderfully varied assortment of green, the most restful and satisfactory of all colours. No colour makes a better foil for a flower, whether it is seen out-of-doors or as a bit of table decoration. One can seldom make a mistake, therefore, in selecting native American trees for planting about a flower garden. The list of these might be enlarged by adding Norway and sycamore maples, the European bird cherry, and any other foreign trees which harmonise with our own. The European cut-leaved birch is a beautiful tree, but it seems to me that its place is on a lawn just in front of a group of pines. When planted with flowers, it would seem to be competing with them for admiration, instead of helping them by making an effective contrast. If the purple-leaved tree is used,

Hooker's hemlock (Tsuga Hookerii), showing the light-green tips of the new growth. All conifers are particularly beautiful at this stage

my preference would be to place it in the background, with some low, green foliage between it and the herbaceous plants. I confess that I have not much love for the golden-leaved varieties of trees, as they always remind me of sickly specimens. As for deciduous trees, they should be planted just after the leaves drop in the fall, or soon after the frost comes out of the ground in the spring. They may be obtained of small size from reliable nurserymen, or sometimes of larger size from the neighbourhood of the place to be planted. The hole in which the tree is to be placed should be considerably larger than the space occupied by its roots, unless the whole space has been recently filled or deeply plowed or trenched. Usually a tree, especially a tree of large size, should be planted a little

The Colorado blue spruce is often seen in flower gardens higher than it stood before moving, as the ground will settle, and a tree looks better springing from a slight mound than it does rising from a hollow. The mound might indeed be extended into a ridge, receding where there are bays, but coming forward and helping give emphasis to the points, so that the flower garden would occupy a gentle valley. At the time of planting, the ends of the roots should be cut smooth and the space between them carefully filled in with good friable soil, and this should be thoroughly compacted by pounding. If the soil is light or sandy, a stream of water from a garden hose will sometimes be useful in settling and packing it. It is also usually well to cut off say two-thirds of the last year's growth of branches. Do not disfigure a tree by cutting off large limbs or "topping" it. Do not attempt to have too great a variety of trees. It is frequently desirable to make a specialty of one kind of tree—for instance, the thorn-apple—using it abundantly, and having comparatively few trees of other kinds. In this way one garden may be given a character that will distinguish it from others. I know of one flower garden that is being formed in an opening between groups of oaks, and no other trees will be planted.

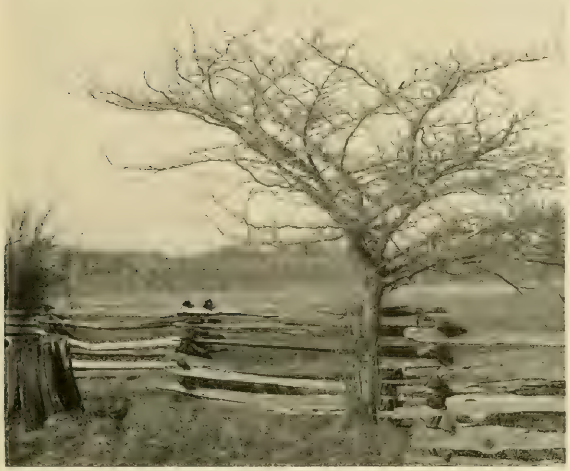

Large trees can now be transplanted by experts during every month in the year

Trees not only furnish a background for the shrubs and flowers, but they make a boundary for the sky. This fact should be borne in mind in the selection of kinds and in deciding on their arrangement. It is desirable to have a large sky space, and this space outlined by the trees should have a shape as informal as the shape of a cloud. The trees should also be chosen with reference to the size of the garden. For a small flower garden only shrubs should be used as a boundary, or perhaps there might be a single

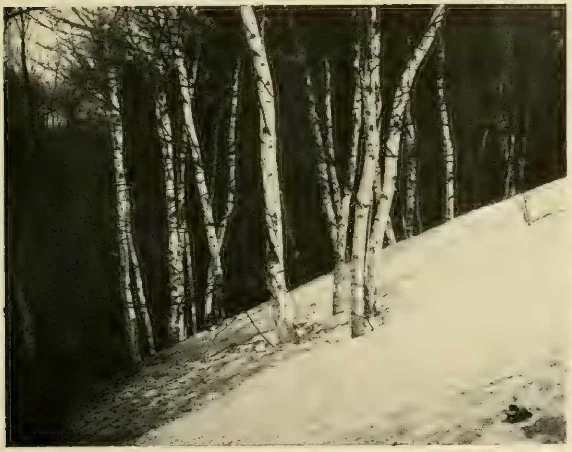
A wild plum (Prunus Americana)

The pepperidge, extravagant in horizontal branches

TREES IN WINTER, SHOWING THE BEAUTY



A wild thorn-apple tree



The native white birch of New England

AND VARIETY OF THEIR BRANCHES

tree or a group of trees on the north side. For a large garden, trees might be used on every side, since in that case there would be plenty of space along the north boundary for plants that delight in sunshine, or the outline could be varied by planting crab-apples in one place and oaks in another. In such a garden it will generally be found that an irregular boundary is the most pleasing. Such an arrangement gives shady bays, with projecting points that catch the sunshine and give character to the picture.

Swamp white oak (Quercus bicolor)

The effect desired will not be produced in a single year. The ground about the trees and shrubs will need cultivation until these are well established. It would be well if this planting could be done a year or two in advance of the planting of flowers. After the

No winter scene is perfect without the evergreens trees are established they may grow more rapidly than was expected, so that soon the problem of cutting away branches or even whole trees presents itself. A garden is not like a house, since it is continually growing, and one must live with it and study it in order to be able to train it in the way it should go. When a branch is to be cut, saw it off next to the trunk or next to the larger branch from which it springs. If a tree must be removed, see that this is done before it injures the trees around it. Sometimes it will be desirable to retain a group of trees in which, although the trees crowd each other, the effect of the whole is satisfactory.

The dead and weak limbs in every neglected tree-top are the best of arguments for frequent pruning. If the weakest competitors in the tree-top are not removed, Nature prunes them in her own way

In conclusion, I think of the ideal flower garden occupying a valley or a depressed space of ground, usually protected on all sides, with the exception of that toward the house, by a woody growth, this growth to vary in size from that of the smallest shrubs to that of the largest trees, the latter, of course, being used only in a very large garden. This border of woody growth will form a frame or setting for the flowers, shielding the sun from ferns and other shade-loving plants in one place, giving the flowers the advantage of his rays in another, and protecting everything from the driving winds. A flower garden can only be perfectly satisfactory when the flowers are in comfortable places—that is, when they have sufficient sunlight, shade, moisture, dryness, and protection from wind, and some of these comforts the trees will help to give.

II. Some Weeping Trees

By W. C. Egan

While weeping trees have their proper place in arboriculture, they never possess the stateliness and grandeur of their upright progenitors. Being abnormal forms, we do not look for such attributes, and are therefore prepared for the weird and fantastic shapes that some assume, and for the formalities of others. There are certain situations in which the weird forms are appropriate, and the formal kinds are well suited to arbours.

Young's weeping birch

The common notion that weeping trees are produced by grafting ordinary trees with buds inserted upside down is quite absurd. Weeping forms have been originated by nature and are perpetuated by man. One seedling out of many thousands, instead of producing a tree of normal upright growth, assumes the pendulous habit. If this happens in an unexplored region, it lives its allotted term of life unobserved, and its peculiarities pass away at its death, as it seldom reproduces its characteristics in its offspring. One branch, or even a twig, of a tree otherwise normal in its structure, may assume a weeping tendency, and it, too, dies with the parent tree. This departure from a type is found, not only in the form of branch and twig, but also in a change in the colour or shape of the leaf, as in the golden elder and cut-leaf maple. Some of these variations come from seed; others are "sports." Man observes these idiosyncrasies, and perpetuates those that please his fancy by grafting, budding or rooting. In most instances, the budding or grafting is on the trunk of an upright form of the same or an allied species.

In *Salix Babylonica*, a native of the Levant, we have a weeping tree that in the seventeenth century was supposed to be the willow mentioned in the 137th Psalm, upon which the sorrowing captive Jews hung their harps. It thus became the typical tree of sorrow.

Tea's weeping mulberry, forming an arbor (see picture below)

This tree is not generally hardy in the northern States, but the late Thomas Meehan had called attention to a sport from it originating upon the grounds of Mr. T. C. Thurlow, West Newbury, Massachusetts, of a more upright form, that has proved hardy there and at the experiment station in Nebraska. There is, however, a substitute for it in the Wisconsin weeping willow, a tree whose origin is clouded in mystery. It is suitable only in large grounds, where ample room may be devoted to it.

The weeping mulberry on its own roots

The willow has given us another handsome weeping form in *Salix purpurea*, var. *pendula*, the purple osier of Europe, which is in reality a broad, spreading, decumbent shrub, often nearly ten feet high. This, when grafted on an upright trunk, is known in our catalogues as "The New American Weeper," and is one of the most graceful of the smaller pendulous trees. The grayish-olive tone of its leafage renders it an admirable subject to be placed well to the front, where a foil of dark-green foliage makes it a conspicuous, though generally harmonious, object.

Undoubtedly the loveliest of all hardy weeping trees is the cut-leaved weeping birch when at its maturity, but unfortunately, in most sections, it dies at the top before reaching an age when it displays its pendulous growth to the best advantage.

Next to it, perhaps, is the weeping beech, which in its youth is almost painful to look upon, but when time has clothed its trunk with numerous tortuous branches assumes a form that presents a tumbling, waving mass of foliage which in some specimens is grand and imposing. No one can form any idea of the ultimate shape this tree will assume. It seems to change its mind with each season's growth, and may eventually form a specimen weirdly grand or grotesquely absurd.

Camperdown elm

These same remarks apply with even more force to the weeping Norway spruce. This, when seen in the dim twilight, with its dark evergreen foliage hanging in clotted masses, suggests the uncouth denizens of the paleozoic forest.

In Young's weeping birch is a fantastic form well adapted to small grounds, but in this case, also, it is a question of time as to whether it will develop into being a pleasing form or not. The weeping larch is another tree of curious growth, requiring age before it may be admired in all its beauty.

The Wisconsin weeping willow

One of the best-known weeping trees is the Camperdown elm, a typical grafted variety whose hardiness is unquestioned. While of comparatively slow growth, it forms in time, and in good ground, a most suitable arbour. A well-grown specimen will droop to the ground and form an enclosure twenty or more feet in diameter, producing a dense, agreeable shade, handsome when in flower, and again when in leaf. When planting this elm, it is well to remember that the doorway to the natural arbour it will form will be between some two of its main, spreading branches, and care should be exercised that this opening will look out upon a pleasing vista.

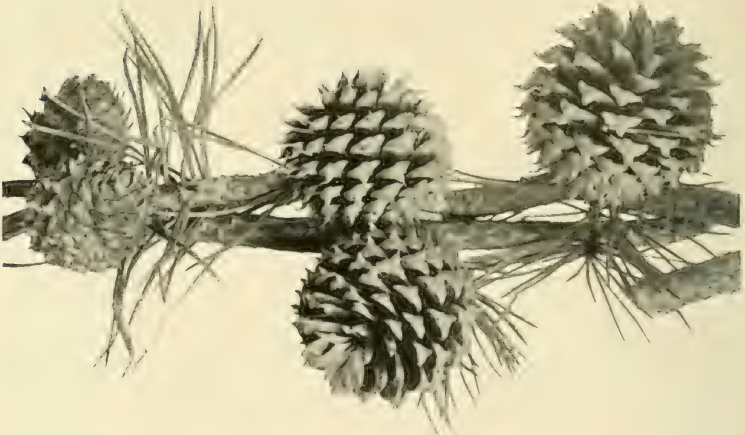
The weeping ash, where it does well and is grafted high enough, forms a splendid arbour much sooner than the Camperdown elm, but it seems more adapted to its English home than to our climate.

Tea's weeping mulberry, of comparatively recent introduction, is one of the fastest growers of them all, and naturally forms a narrow arbour. The new growth starts out from the upper part of the present branches, arches slightly, and then hangs down straight. These new branches rob the inner ones of light and air, causing their decay and death, but the new branches are annually increasing the spread of the top, and in time form an arbour. In order to hasten the formation of a fair-sized arbour, cut the head well back, in the spring or at the time of planting, fasten an iron ring or wooden hoop under the outer rim of the head, and train the branches out laterally for two seasons. The hoop should be wrapped with burlaps to prevent chafing, and the branches tied to it.

The glittering raiment of soft snow

Weeping mulberries are grafted on upright forms. An illustration is given (page 93) of this tree, growing on its own roots, where the branches droop from the trunk all the way up. It is not a thing of beauty, but of curiosity. Had it not been supported from the time of planting it would be sprawling upon the ground. In planting a weeping tree to form an arbour, one must procure a specimen grafted at least six to seven feet high in order to obtain sufficient head room.

The gem among the flowering weepers is the Japanese rose-flowered weeping cherry, which, in early spring, and before the leaves appear, is a fleecy, feathery mass of bloom, completely covering every part, swaying with the winds, and hiding its nakedness while putting on its summer foliage.



CHAPTER V. VINES AND CREEPERS

I. Select List of Vines

By W. C. Egan

THERE are so many kinds of vines excellent in foliage, flower, and berry, and so many effective ways of growing them, that one is often at a loss what to choose and how to proceed. My first choice for a permanent covering of porch pillars is the Japanese *Akebia quinata.* Its good points are: freedom from the attacks of worms or caterpillars (whose acrobatic feats of dropping from an unknown height and landing upon one's neck I do not enjoy), the early unfolding of its leaves, the lateness of their retention, and the delicate silhouettes its five-fingered leaflets form against a moonlit sky. This vine is quite hardy, and a rapid grower when once established in good light soil. Its flowers, appearing in early spring, are more curious than attractive, being small and spicily fragrant. It seldom fruits in this country. It is a social vine, allowing friendly neighbours to encroach upon its rights without apparent injury to itself.

The main vine embowering my porch is the Akebia, which is planted at the base of the pillars. Between these pillars the large-flowered species of clematis are freely used, but I also grow *Clematis Flammula* for its fleece-white bloom in midsummer, and moderately young plants of *Clematis paniculata* for the same effect in early autumn. Both of these are cut back when through blooming—at least, any portion of them that may have grown over the face of the Akebia, since I wish to allow the latter to enjoy full possession of sunlight and air part of its growing season. *Clematis Flammula* is never a very strong vine with me, and when the paniculata gets too rampant it is removed.

Virginia creeper

My next favourite of the hard-wooded vines (those that do not die back in winter) is also a Japanese plant—*Celastrus orbiculatus*, a relative of our bittersweet. It is not adapted to porch decoration, as its long, waving, semipendant arms are too vigorous and rampant, and would be seriously in the way, but for arbours or large arches it is admirable. While its foliage is good at all times, its chief beauty is its berried effect in late autumn and throughout the winter months, just at the time when the echoes of the summer glories are most welcome. Fortunately (for me, at least), where the ravine-nested birds are so numerous, its berries are unmolested by the feathered tribe, and remain pendant all winter, like coral beads floating in the air. In this species they are more numerous than in its American relative, *C. scandens*. I imagine the Japanese form to be the stronger grower of the two.

Vines overrun it on all sides, and convert its spacious verandas into avenues of shade

An effective way to grow the American bittersweet is to allow it to twine around an iron rod. I use a three-inch iron pipe, set in a block of

L. of C.

An aged or dead tree can often be completely covered by vines with good effect

cement at the bottom of the hole, to steady it against heavy winds. Its effect in winter, when in its berry garb, is fine. These vines are very accommodating as to situation, thriving in full sunshine or partial shade.

The Virginia creeper (*Ampelopsis quinquefolia*) of our woods, which colours so beautifully in the fall, is best placed upon your neighbour's gate-posts or your barn, where you may admire it at a distance, and where the caterpillar may feed upon its leaves and not become familiar with and attached to you. Or it may climb up the trunk of defunct oaks, or any large tree, where it may hang in festoons from the lower branches. Young trees should not be used for this purpose, as they are apt to be smothered and eventually killed. Sometimes a boulder can be partially covered by a Virginia creeper with good effect.

The honeysuckles are excellent to cover wire fences, or for grouping on sunny slopes and then allowed to bunch and trail at their own sweet will.

The Dutchman's-pipe, in sections where it does well, is a clean, vigorous-looking vine, with heavy overlapping foliage, bearing flowers which are tantalising to one who has recently sworn off smoking.

The trumpet creeper is suitable for training against a clothes-line post. It should be pinched back when it reaches the top; it will then form a shrub-like head. Or it may be allowed to climb up into some large tree and roam around its branches.

The two matrimony vines, *Lycium Chinense* and *L. barbatum*, may be used with effect on low trellises. The first-named is the finer in berry, but near Chicago *L. barbatum* is the stronger grower.

The moonseed makes a good cover for clothes-line posts, but, if recent reports are true, its berries are poisonous to children.

The Boston ivy is too well known to mention. It is the best of all vines for house-walls in America.

Where artificial supports are given to a vine, let them be of a permanent nature, such as iron rods or gas pipes. Perishable trellises generally look limp and intoxicated by the time the vines are luxuriously developed and approach our ideal of vine beauty. It is also demoralising to see them sprawling upon the ground after some wind-storm.

It is often desirable to close the end of a porch-opening, either to shield from public view, to shut out the sun, or to hide an unpleasant aspect. This is easily accomplished by planting thickly and supporting the vines on light iron framework.

II. A CONVENIENT CLASSIFICATION OF VINES

BY J. A. R.

WHAT vines shall we grow? This will depend chiefly on location and aspect, but to a considerable extent also on the character of the object to be covered, whether of brick, stone or wood. Vines may be roughly classified by their manner or habit of growing.

A pergola at Biltmore

1. *Twiners.* In this group belongs the native bittersweet (*Celastrus scandens*), which has inconspicuous flowers, but bright orange capsules with scarlet berries inside. Long strings of bittersweet are often used for home decoration, as the berries last all winter. The plant is hardy everywhere, and is desirable for covering low objects or latticed verandas. The Dutchman's-pipe is a rapid grower, and can stand thirty degrees below zero. It has large, heart-shaped leaves and odd flowers. The native and Japanese hop belong to this class; also moonseed. Actinidias are attractive twiners, free from insect diseases, and useful for covering arbours.

2. *Climbing by discs.* Here belongs the *Ampelopsis Veitchii*, commonly called ampelopsis, Boston ivy, or Japan ivy. This is by long odds the most popular vine for stone or brick walls. It reaches a great height, colouring beautifully in autumn. There is a form of the Virginia creeper which has discs instead of tendrils; the nurserymen sell it, and it is sometimes found wild.

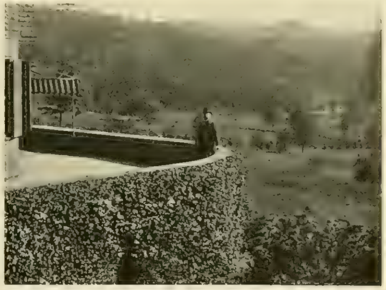
Arbour covered by one of the matrimony vines, Lycium barbatum

3. *Climbing by tendrils or aerial roots.* English ivy (Hedera)

Rose arch at Mr. W. C. Egan's

is a slow grower, but lives long. It is practically our only evergreen climber, though Hall's honeysuckle holds its leaves well into winter. English ivy succeeds on north and east brick or stone walls in central New York; farther north it is likely to winter-kill. The trumpet creeper (Tecoma) also climbs by aerial roots. It reaches the top of tall buildings, but it is more suitable for lower stories. In its wayward, strolling habit there is much that is artistic. If one would have bloom, annual spring pruning is desirable.

4. *Requiring support.* Among the numerous vines of this class are clematis, notably *C. Jackmani* and *C. paniculata.* They climb fairly well after receiving some encouragement, and are attractive in fruit as well as in flower. Honeysuckles and roses are general favourites. The evergreen character of some types of the former, and the free-blooming habits of the ramblers and Wichuraianas, make them favourites with rich and poor alike. The matrimony vine (*Lycium barbatum*) has neither tendrils nor twining habit, but when trained to supports on a veranda the general effect is gracefully artistic. Nor should we overlook the wistaria, richly tropic in the luxuriance of its flowers.



Ampelopsis on a wall

III. Some Pumpkins

By William Chambers Wilbor

Having experienced in former years the advantage of training pumpkins on poles and trees, I determined last spring to build a trellis over the kitchen door, on the south side of the house, for shade, ornament and fruitfulness, and I was much pleased with the beautiful effect.

I planted the seeds of the small pie pumpkin in a box, in the house, early in April, and they were almost ready to run when I set them in the ground about the first of June. Five plants were set out a foot apart on each side of the steps.

Pumpkin vine at the back door

I spaded deep into the rich soil, and powdered it fine, leaving a saucer-shaped depression in the ground about the plants so that the moisture would settle around the roots and not run off.

Three or four times during the season I stirred the soil thoroughly with the hoe, and watered the vines with liquid fertiliser from the stable. A more interesting subject for nature-study I have never had. My vines grew about six inches a day, and every few days I found it necessary to tie the sprays to the wires and slats of the arbour.

In a few weeks they had reached the top of the trellis, and formed a canopy of shade so dense that the sun could not shine through, even in spots. The leaves grew so large that they resembled palm leaf fans, and the scores of rich golden blossoms, opening every day during the summer, were wonderful to behold. The pumpkin arbour became the admiration of the whole neighbourhood. Seven golden pumpkins ripened and were duly made into pies.

I learned several interesting and profitable lessons from my experiment.

1. That no plant or vine grows more rapidly, or makes a more luxuriant, tropical, and dense shade, than the pumpkin vine.

2. The tendrils are so strong that, after they have made a dozen tight coils about a wire or around each other, they become almost as tough as the wire itself.

3. Pumpkin vines possess remarkable vitality. One stem was crushed underfoot and held together by only a few fibers, but I bound it tightly together with a strip of muslin, and it climbed to the top of the frame and bore a ripe pumpkin; another branch was broken more than half in two, but it grew right on and bore fruit.

4. The male and female blossoms were also an interesting study. The former were very numerous, and bloomed at the end of long, slender stems, while the latter grew on stout, thick stems, with embryo pumpkins well formed back of the blossoms before they opened.

5. The fruit grew in greater profusion, ripened more perfectly, and had a better flavour than when it grows on the ground.

6. Though the bugs were very troublesome last summer, and destroyed almost all of the pumpkin and squash vines in our vicinity, my climbing vines were not molested by them.

7. It was very entertaining to watch the ripening of the pumpkins. At first, small round spots or stars of yellow appeared on the surface. Then followed an intricate tracery of yellow lace, woven by Nature's skillful yet invisible fingers upon the groundwork of deep green, which grew brighter and more distinct from day to day, until the whole orb of emerald turned to a globe of gold, and by the sun became a sun in miniature by other suns surrounded, in the zenith of our arbour's sky, and the fruit of the pumpkin tree was ripe and ready for the harvest.

Side view of pumpkin vine

8. It is worth while to examine the commonest plants, especially the vegetables, with reference to new combinations of use and beauty. Take rhubarb, for instance. Unlike many of the foreign things that are wanted for broad-leaved effects in the hardy border, it is sure to grow.

IV. Annual Vines to Conceal Rubbish

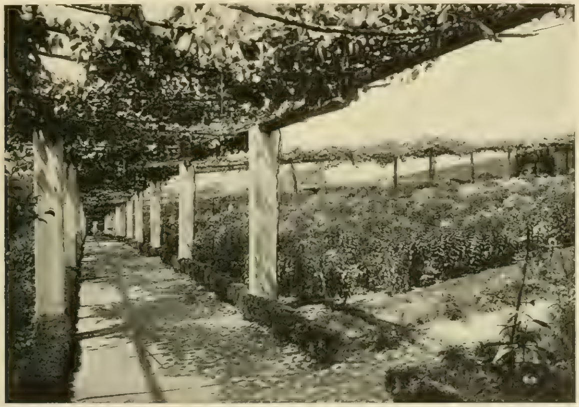
By "The Fullertons"

There is nothing that will improve a place more than having the garbage, ashes and trash out of sight, especially if the place be small and in the suburbs. When we moved just out of New York City, early in May of one year, we decided we should make the hiding of these unsightly cans our chief aim of the garden that year.

To begin with, we purchased two corrugated galvanised iron ash barrels and one garbage can. These we painted a gray green, then placed them in a pen back of the grape arbour. Along the back of the pen there was a very pretty arbour-vitæ hedge, which helped us greatly in our scheme. The sides of the pen were made of chicken wire, and on one of these sides we planted climbing nasturtiums, and on the other ornamental gourds, wild cucumber vine, and castor-oil bean. Along the hedge on each side were

Unsightly objects screened by wild cucumber and nasturtium sunflowers, which, when they grew to a height of ten feet, drew attention from anything below. We led the gourd and cucumber over to the grape arbour some distance away, also along the clothes-lines and posts. This almost made a roof, and draped the front of the pen so prettily that the objects inside were hardly noticeable at all.

The wild cucumber is one of the most useful and ornamental of the annual climbers. It has an extremely pretty leaf and feathery white flowers, while the large oval seed-pod is covered with spines. It drops its seed very abundantly, and will reappear year after year.



A pergola in a formal garden at Brookline

V. PERGOLAS—A SUGGESTION

BY "M."

THE word "pergola" is in common use to-day, yet you will not find it in the International Dictionary, unless in some very recent edition. A pergola might be defined as a sort of glorified grape arbour. The only difference is that a pergola is usually a costlier structure, and is supposed to be beautiful in itself. Also, it may be covered with any kind of vine, not merely the grape, as it is erected to display the beauty of lines and of foliage and of flower, the item of fruit being wholly incidental. The old-fashioned grape arbour was a shady retreat where the housewife might sew in peace, and a deal of courting has been done under its gracious protection. The ordinary grape arbour, however, is a rather flimsy structure, which gives way under the eager feet of the small boys who steal over the back fence the first day the green grapes begin to purple. In the winter its frame is usually gaunt and cheerless. The pergola, however, is the delight of American architects to-day, and no great estate is complete without one—at least, wherever formal gardening is anything of a feature. There is a beautiful pergola at Arlington, near the nation's capital, where one may rest and ponder upon the great spectacle of the army of the dead.

VI. A BIT OF NATURE'S GARDENING

BY W. C. S.

THE picture below shows an old, long-abandoned flour-mill in the beautiful valley of St. Helena, Napa County, California. At certain times

A bit of Nature's gardening—an abandoned mill covered by native vines of the year the mill is almost covered by vines. This is a familiar sight to anglers in the neighbourhood, as the stream that runs by the mill is noted for its trout.

Here is a suggestion for the treatment of deserted buildings of all kinds. These eyesores might just as well be things of beauty. Vines will make the transformation. Are there not some tumbledown buildings in your neighbourhood? If so, why not start some native perennial vines against their walls? Perhaps the Virginia creeper grows wild in your neighbourhood. Dig up a piece, carry it off in a basket, and plant it where it will do the most good. You will do the community a good service, and the experience will be worth while for its own sake.

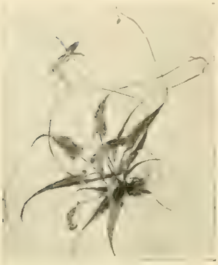
CHAPTER VI

NATIVE FERNS FOR SHADY PLACES

BY W. H. TAPLIN

SIDE yards that revel in sunshine are few and far between on many city streets, and as a natural consequence flowering plants in shady corners often turn out to be miserable failures. Nevertheless, there are possibilities in the gardening art even in the shadiest of side or back yards, and one of the most interesting and beautiful of these possibilities is found in the form of a fern garden, in which are planted some of our native ferns. Many of these ferns are procurable by means of an excursion to the suburban woods or else through the medium of a dealer. The best time for transplanting them is in the spring or early summer, though some of the stronger-

A glimpse of the wild gardening in a wooded ravine. Ostrich fern, trillium, Virginia cowslip, and lady's-slipper growing species may be moved from their woodland home at almost any time during the growing season, provided a good-sized ball of earth is taken up with the roots.



The walking leaf

But the soil in the side yard is not infrequently ill suited to encourage the growth of tender plants. Too much subsoil thrown up at the time of housebuilding, and too much coal ashes and other refuse mixed in at the time of grading, combine to produce a condition far from favourable for our proposed fern garden. "Lacking in humus" is what the agricultural scientists would be likely to say about such a soil, and it is humus or decayed vegetable matter, such as leaves, roots, and twigs, that forms the greater portion of the natural soil in which the wild ferns are found growing so luxuriantly. Where the side yard presents these poverty-stricken conditions of soil, it would pay to make a little preparation before planting the ferns, by digging out the proposed bed to a depth of one foot, or perhaps fifteen inches, and then filling it in with some good garden soil or else woods' earth. The ferns should not be buried too deeply in planting, but have the soil pressed firmly around the roots. The crown or center of growth should be just about at the surface of the soil.

Copyright, 1901, G. A. Woolson

Asplenium Trichomanes, the fern which the English call "maidenhair." It is also native to the United States

The maidenhair is one of the choicest of our native ferns, but transplanted specimens seldom thrive as well as those in the woods. Success is generally had in proportion to the accuracy with which one can reproduce the natural conditions.

The climbing or Hartford fern (*Lygodium palmatum*) does not require the exclusion of direct sunshine to the same degree as does the maidenhair, and while the earth in which it grows is always moist, yet the wooded upland in which it is sheltered presents some entirely changed characteristics that

Maidenhair ferns naturalised on the Hunnewell estate at Wellesley

the observant explorer is quick to note for future reference. This plant is very rare, and should never be taken from the woods. It should be purchased of a nurseryman who will guarantee that the plants are cultivated by him, not taken from the wild.

Christmas fern, showing last year's fronds and new fiddleheads

Then there is that singular member among our native ferns the peculiar habit of which gave rise to the Indian designation of "walking leaf." The walking fern is seldom met with in considerable numbers in any one place. The long, narrow leaves of this fern are shaped somewhat like an elongated arrow-head, the point of which seems to seek the earth from which it sprung; and when this leaf completes its growth and its slender tip is resting on the ground, roots are emitted, a new bud forms, and soon we find a young plant attached to the leaf-tip of the parent, and in its turn reaching out with tiny stride toward new territory. The "walking leaf" is perhaps less happy under cultivation than are other and stronger-growing species, but owing to its singular habit this plant has much attraction for the plant collector, and once discovered is seldom allowed to rest in the shady quietness of its native woods.

The cinnamon fern

But these already mentioned may be classed among the modest and retiring members of the great fern family, and there are a number of others that are much more obtrusive, presenting themselves in great masses of feathery foliage that almost give a tropical aspect to what are generally looked upon as merely "sprout," or second-growth woods, in prosaic New Jersey or Pennsylvania.

Among these ferns of greater growth is found the common "brake" (*Pteris aquilina*), a species that is now very common in many portions of our country, though in reality an emigrant rather than a native American, for the bracken is supposed to have been introduced from Europe. The foliage of this noble fern rises to a height of four or five feet, is much divided into narrow segments, and is of a very pleasing light green throughout the summer; but as autumn approaches the leaves are seen to turn gradually to a bright yellow, and from this to brown, for this fern is not an evergreen.

The clenched fists of expanding ferns

Open glades in the woods often provide the abiding place for this fern, where its sturdy foliage gets a fair amount of sunshine, and at the same time sufficient moisture to furnish sustenance for its abundant roots. The "royal fern" (*Osmunda regalis*), also known as "flowering fern" owing to the peculiar manner in which the fertile fronds are thrown up in the center of the plant's growth, is more of a swamp-lover, and is often found growing in a rather wet bottom. Fortunately, the "royal fern" is not an extremely difficult subject to transplant from the woods to the home grounds, but a moist bottom and a partial shelter from sunshine are requisites for the best progress of the transplanted specimen

The cinnamon fern (*Osmunda cinnamomea*) is another interesting member of this family, and shows great ability to adapt itself to its surroundings; for while its most natural habitat is a somewhat swampy field, or along the outer edge of a swamp, yet this same cinnamon fern has been found in considerable numbers on a very dry and stony bank beside a dusty road in Delaware.

Then there is the "Christmas fern," the long and narrow fronds of which remind one of the sword ferns, and are used in vast quantities by florists all over the land as a groundwork or backing for floral designs. These fronds are gathered by the million, in Michigan and other of the northern States, in the fall, and are carefully packed away in cold storage by the wholesale dealers until such time as the market demands them.

The botanist, with his knapsack for the reception of choice specimens, does but little harm to our native flora, and the specimens he captures are taken in the interests of science, but what can be said for the botanical pot-hunter, so to speak, who ships fern fronds to the number of 3,000,000 per annum to one of our large cities?

The blue asters among the ferns

CHAPTER VII. BULBS

I. Hardy Bulbs for Fall Planting

By Patrick O'Mara

THE time to prepare for the spirng feast of flowers is in the fall. Too often people forget all about it until they see the tulips in the parks or in their neighbours' gardens, and then they hie to the bulb-seller in a quest for bulbs. Generally speaking, from the middle of October until the ground is closed with frost the spring-flowering bulbs may be planted. Some of the species are late in ripening—lily-of-the-valley, for instance—and so the planting stock is not available until November. In our northern climate frost and snow may have made their appearance before these are procurable, so the expedient of covering the ground where they are to be planted must be adopted. Coarse bagging spread over the ground, and a covering of three or four inches of leaves, hay or litter of any kind, will answer. The best bulb garden the writer ever had—a small one, 'tis true—was planted on New Year's Day, the soil having been kept frost-free by the method described. However, unquestionably, the earlier the better. The first customers get the best stock, and the amateur will do well to order his hardy bulbs in September, for October planting.

The ideal soil for most bulbs is a friable, sandy loam, well enriched with barnyard manure in which is a goodly proportion of cow manure. This, bear in mind, must be thoroughly rotted and mixed to obtain best results. It is a common practice for amateurs to get manure fresh from the horse stables and put it in the soil. The fermentation is almost sure to kill the roots. In case properly prepared barnyard manure is not available, then a concentrated fertiliser may be used. This can be obtained of any dealer. The brand does not make much difference. Any complete fertiliser will do. Of vital importance it is to thoroughly dig the soil and pulverise it; also to see that water does not lodge on the beds where bulbs are planted. Let them be raised above the surface of the garden and sufficiently convexed to shed the rain that falls. It will repay, also, to cover the beds with two or three inches of the manure already described, not alone for the protection given to the bulbs, but also for the sustenance derived from it. That covering should be taken off in the spring, when all danger of severe frost is past, about the time the bulbs begin to send up their growths. This refers particularly to hyacinths and tulips, but applies to nearly all varieties.

Double Narcissus Sulphur Phoenix

The place to plant bulbs and the formation of the beds must be determined by the individual facilities of the planter. If opportunity exists to have large beds in fancy designs, they should be adopted—nothing is more attractive. For this purpose hyacinths and tulips are admirably fitted. Curved beds or fancy scrolls of tulips along the drives on large estates, or even on modest ones, are most effective. In planting, care should be taken to obtain varieties which bloom at the same time and attain the same heights, or the desired effect will be lost. Round, square, oblong, crescent, star-shaped, oval—in fact, any bed design which suits the owner's fancy and will harmonise with the surroundings may be adopted for planting hyacinths and tulips. Good contrasting colours should be used and so planted as to bring out and accentuate the adjoining colours. Beds of one solid colour will find favour with many, and are very effective. All the dealers in bulbs cater to the demand for this style of planting, and have lists of varieties made up especially for it, so that the intending planter need not be at a loss as to what varieties to select. All he need decide is the size of the beds and their form, and the dealer will be able to give him the material, properly selected, for planting them. It is well, however, to note the names of particular varieties which have given the planter especial satisfaction.

In park work and public places, where it is imperative to get the very best results, it is the common practice to discard the tulips and hyacinths after they have bloomed once. The amateur, however, may remove these bulbs to a less conspicuous position, as the back yard, the hardy border, or the wild garden, where they will continue to bloom year after year indefinitely. It is now a mooted question, considering the price at which new and superior bulbs can be purchased, whether or not it is worth while taking up hyacinth and tulip bulbs and keeping them for a succeeding year. If it is to be done, the time to do it is after they have ceased flowering, when the leaves turn yellow. Dig them then, place them in a sunny position, put enough soil on to cover the bulbs, and when all vegetation has gone from them put them away in a cool, well-ventilated place, until time to replant in the fall.

Indiscriminate planting in the border is much easier than bedding, and here the veriest tyro can hardly go wrong. Wherever there is room, put in some bulbs, singly, in pairs, in half-dozens and dozens; the keenest pleasure is derived in finding the unexpected come up here and there. This is the place to plant bulbs for the purpose of cutting; in the design bed, cutting the flowers will mar the effect of the whole, but they are not missed from the mixed border. This is the place for jonquils, daffodils, all varieties of narcissi, and yet they are thoroughly at home in large beds by themselves. It is the place also to put in clumps of the lovely lily-of-the-valley, the stately iris, and the massive peony which is often considered by dealers as a bulbous plant. Here they live and have their being year after year, undisturbed by the vagaries of Dame Fashion; for, even in matters of the garden, the fickle jade will interfere, and the design which finds favour this year may be frowned upon the next.

Trumpet daffodil (Horsfieldii)

Bulbs may be introduced with effect along the confines of grounds and in out-of-the-way places, just on the borderland of the cultivated and the uncultivated, in the shade of trees, along winding paths here and there—in such a way as not to mar the natural effect desired in such surroundings. In such places, crocuses, lilies-of-the-valley, narcissi, snowflakes, scillas, trilliums, snowdrops, chionodoxas, hemerocallis, funkias, lilies, etc., blend in perfect harmony with their environments.

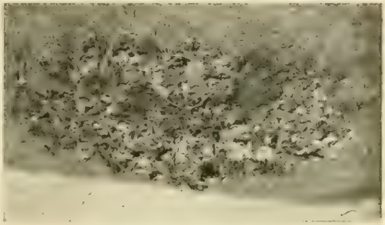
An appropriate and very effective place for planting bulbs is on the lawn. Such bulbs as crocuses and *Scilla amœna*, a very early flowering variety, are preëminently adapted for this purpose. They look best when planted in irregular patches here and there, as if they came up naturally—a patch of the yellow in one place, the blue in another, the white in another, and again the purple. Chionodoxas, winter aconite, snowdrops, triteleias and bulbocodiums are useful for this method of planting, and very appropriate. They may be planted with a dibber; or the sod can be removed, the bulbs placed in position, and the sod replaced. They bloom early, and mature before the grass needs cutting in spring, so the lawn effect is not marred.

(Narcissus Van Sion) Double golden daffodil

First in importance among hardy bulbs I should place the hyacinths. Much has been written about putting them in position in the bed and then covering them with soil, putting sand under them, etc., but in actual practice these slow and laborious methods are not essential to success. If, however, the planter prefers to follow the more laborious—and possibly surer—method, then remove five or six inches of the top soil and cover the surface of the soil where the bulbs are to be set with an inch of sand. One advantage of this method is that it enables the planter to accurately place the bulbs in position as to depth and distance apart, so that the effect at

Tulips in a formal bed, showing the strength and simplicity that result from planting only one variety in a place

flowering time is more regular as a whole than if planted with the dibber. The layer of sand has its advantage, inasmuch as it provides drainage at the base of the bulbs and minimises the chances of decay from contact with manure in the soil and from water lodging immediately beneath them. The writer has seen good beds of bulbs obtained by both methods, but the last one described is possibly the surer one.



A bed of squills covered with leaves for the winter

The ground having been made ready, as previously described, and marked off for the various sorts if a design is to be planted, all that is necessary is to use a blunt stick and make a hole large enough to receive the bulb and deep enough to have the crown three to four inches below the surface, and place the bulb in it. Cover the bulbs, smooth off the bed, and the work is done. The proper distance for planting is six inches apart. The hyacinth referred to here is the common "Dutch" kind so familiar to all. They can be obtained in separate colours or in special named varieties. They are in two leading classes—single- and double-flowered. For garden planting the single-flowered sorts are to be preferred, as they are more graceful and the spikes are not as heavy, so they stand up better. It may be found necessary to support the flower-spikes with light sticks.

Next to the hyacinth in importance comes the tulip. The directions for planting the hyacinth apply to the tulip also. There is a greater variety of these than in the hyacinth—single and double, early and late, tall and dwarf; beware of getting them mixed in the same bed. The leading dealers now offer a class of "bedding tulips," and these, generally speaking, are the best to plant in beds. An effective method which has recently come into vogue for planting tulips and hyacinths is to cut fancy scroll designs out of the sod, wide enough to hold two or three rows, and plant the bulbs to follow the design.

The same bed in bloom

The tulips known under the general title of bedding varieties do not embrace the late-flowering sorts—those which bloom in May and which are in bloom generally at Decoration Day. These latter are quite distinct in every way from the former; they grow taller and have larger flowers. They should be planted in large masses to obtain the best effects, but even singly or in small groups they are distinct and showy.

As cut flowers they are superior to the earlier varieties on account of their longer stems and greater substance, remaining a week in good condition after being cut. They are very hardy, and may be left where they are planted; in fact, they improve each season. This type is generally known as Darwin tulips.

A group of crocuses

Narcissi come next in importance. The varieties of this prime favourite are "too numerous to mention." Suffice it to say that, for general planting, the sorts embraced under the general head of daffodils, with the white-flowered poet's narcissus, are the best. From four to eight inches apart, according to the variety and size of the bulb, are the proper distances for planting. These are especially adapted for planting in mixed borders, among hardy herbaceous plants, between shrubbery, and along walks and drives. They thrive in almost any soil or situation, although they attain greater perfection when liberally treated. The best place for them is in a thoroughly drained, moderately rich, friable soil in which is a fair amount of sharp sand or sandy leaf mould. If the soil is not thus constituted naturally, it will amply reward the planter to thus prepare it. Where it is at all possible, a position should be selected for planting them where they will be shaded by trees or a building, as the flowers on the whole will be larger, and, above all, they will remain in perfection for a greater period, than if planted in an exposed position where they get the full rays of the sun. They should be planted so that the crown of the bulb is three inches below the surface. The jonquils, being much smaller bulbs than the general variety of daffodils, should be planted only two inches under the surface. The foliage should be allowed to ripen thoroughly before being removed, after which a top-dressing of loam and thoroughly rotted manure will be found of great advantage. For outdoor planting, special mention should be made of the following: Ard Righ, Emperor, Horsfieldii, Princeps, Trumpet Major, Incomparable, Sir Watkin, Maximus,

The poet's narcissus. (Narcissus poeticus)

Stella, Poeticus ornatus, Biflorus, Van Sion, Orange Phœnix, Alba plena odorata, and all the jonquils.

Scillas have already been mentioned as being preëminently fitted for planting on the lawn. Like all the bulbs, they prefer a light rich soil. The Amœna or Sibirica præcox is the most useful and beautiful of the species. These, by the way, are commonly known as squills. The flowers are produced in wonderful profusion, a beautiful rich blue, and appear almost before the snow has vanished. It is a gem among bulbous flowering plants, so beautiful that no garden is complete without some. Planted among the rocks or in an artificially made rock garden, it is a strikingly beautiful object. *Scilla campanulata* is also a charming variety, and can be had in blue, white, and rose. This is commonly known as the wood hyacinth. A colony may remain undisturbed in the ground for a number of years, as the natural crowding does not seem to injure them.

Another very useful bulbous plant is the snowdrop, *Galanthus nivalis*. It should be planted in masses and closely together, about an inch apart. Combined in beds with scillas or chionodoxas the effect is charming. It is best to plant where they can be allowed to remain from year to year; along the edges of hardy borders is a fitting place for it. There are new and improved sorts, such as Elwes's Giant and King of the Snowdrops, which are superior to the original type.

Chionodoxa, commonly known as "glory of the snow," is an exquisite plant, blooming early in the spring and bearing ten to fifteen scilla-like flowers, a beautiful intense blue with a white center. As an edging for a shrubbery, or bed of hardy perennial plants in connection with scillas and snowdrops, or for planting on the lawn, or in out-of-the-way places as "naturalised" plants, they are unequalled. Cultivate the same as scillas.

Trillium grandiflorum, the great American wood-lily, as it is called, is another very useful bulbous plant. This should be planted early in the fall in soil which has plenty of sand or leaf-mould. The flowers are pure white, changing to soft rose.

Bulbocodium, or spring colchicum, is one of the favourites for the bulb garden. *B. vernum* is the best known and is a charming early spring-blooming plant. It bears rosy purple flowers, and is one of the first to make its appearance in spring. It succeeds well in any garden soil, and should be planted about three inches deep in clumps or masses. Its chief interest is that it generally blooms a week before the crocus.

Tulips edging an informal shrubbery border. After growing tulips or hyacinths in beds for a season, the amateur may transfer the bulbs to the garden border or some other out-of-the-way place, where they will last for years

The camassia is also a very desirable bulbous plant among others in the garden. It resembles the common blue scilla, but is much larger, its leaves being about a foot long and very narrow. It is commonly known as Indian Quamash. It does best in sheltered and partly shaded positions. The flower-stalks grow from two to three feet high and bear twenty or more blue flowers each two inches across. It is fine for cutting. Grown in a mass it is very effective. Grape hyacinths should be in every garden.

Crown imperials are among the most showy of bulbous plants. There are dwarf varieties which are very effective in the garden. They may be left untouched for years. In the blooming season, should the weather prove dry, the ground must be frequently well soaked with water, that the growth may be vigorous, or the flowers of the following season will be deficient.

Erythronium, the dog's-tooth violet, is a charming plant. The foliage is usually variegated. A mass of this is an attractive object in the garden at all times. There are numerous species in cultivation. The California kinds are worth especial study.

A bed of narcissus

Last, but not least, are the anemones. The varieties of *A. coronaria* form a most brilliant group of spring-flowering bulbous plants, producing enormous quantities of bloom of every shade of colour, both double and single, and of very varied form. Though perfectly hardy south of Washington, District of Columbia, they are not entirely so in this latitude, but if planted in September or October, about two inches deep and protected by a cold-frame in winter, they will flower magnificently in spring. The tubers, however, keep well through the winter, and may be planted out in spring for summer blooming.

The fall is also the best time to plant lilies, but as they are generally regarded as summer bloomers they will not be treated in this connection. It is possible to plant lilies in the spring, but the bulbs start early and should not have a setback. In this connection I would remind the reader that many other bulbous and herbaceous plants, as peonies and iris, which are commonly planted in the spring, can be planted also in the fall.

There are many other bulbs and roots which can be planted in the fall which are not specifically mentioned, but I trust that enough has been said to create a wider interest in this beautiful and valuable section of flowering plants.

II. Practical Directions for Bulb Culture

By Edward J. Canning

Fall bulbs are so called because they are received and planted in the fall of the year; also in contradistinction to summer bulbs, which are planted in spring. They are nearly all imported from Holland. Millions of them are brought into this country during September, October, and November. Fall bulbs include all those early spring-flowering bulbous plants which brighten up the garden almost before the dreary days of winter are past. Crocuses, snowdrops, scillas, star of Bethlehem, narcissus, daffodils, jonquils, tulips, and Dutch hyacinths are household words.

From the little attention that these plants require, together with their cheapness, there is no reason why any one who may possess only a few feet of ground should not have and enjoy them, and extend their cultivation in grounds of more ample proportions. Their requirements are simple indeed. We plant them in the fall because it is the season in which they make their roots and establish themselves well in the ground ready to begin work in spring. All bulbs must be well rooted before active growth can take place aboveground. In this they are somewhat analogous to seeds which, when germinating, always make the roots first, so as to be able to draw nourishment from the soil to support the growth aboveground.

The depth of planting fall bulbs varies with the different species, but all should have a covering of two inches of soil above the top of the bulb. Therefore, hyacinths and narcissus should be planted five to six inches deep according to size of bulbs, tulips four inches, crocuses, snowdrops and bulbs of similar size about three inches deep.

Bulbs are not fastidious in regard to soil, though a loamy soil with a tendency to sandiness is best. The best fertiliser is thoroughly decayed farmyard manure, or ground bone meal, and only a very moderate dressing of either, which should be forked into the soil when preparing to plant.

They may be planted in the mixed flower border, or in formal beds or borders near the dwelling, or best of all (tulips and hyacinths excepted) they may be naturalised in such positions as under deciduous trees, on grassy slopes around the edges of lawns or shrubbery borders, along the edges of woods, or in any wild or semi-wild positions in company with trilliums, anemones, decentras, and many other early spring-flowering plants. A bank of crocuses under large deciduous trees or irregular colonies of daffodils along the edges of woods or on grassy banks is a beautiful sight, while snow-drops, scillas and star of Bethlehem are well adapted for naturalising along woodland paths and in open groves. In such positions they should be planted in quantities in order to be effective, and as irregular as possible, and not in square or circular colonies. Always aim to make them look as natural as possible.

Tulip. "Kaiser-Kroon"

When once planted, most bulbs will increase and flower each year provided the foliage is not cut off. This must be allowed to ripen off naturally, which will take until the end of June.

Tulips and hyacinths, being so highly cultivated or so far developed from the wild types, do not lend themselves well for planting in wild or semi-wild positions. They are best adapted for formal beds or borders near the dwelling. Tulips and hyacinths should not be planted together in the same border or bed, because the times of flowering differ, and unless very carefully selected and arranged the colours of the flowers will not harmonise well. Before planting, the beds should be given a dressing of fertiliser, then dug and raked very smooth. The bulbs should then be placed regularly all over the bed before they are planted, so that each bulb shall have just so much to develop hyacinths seven inches apart, and tulips five. They should then be carefully planted and the bed left very smooth and even. The flowers of both tulips and hyacinths embrace a good range of colour, and colour designs can be made when planting. Suggestions for the same may be found in almost any bulb catalogue. It is important in planting tulips to plant the early-flowering kinds together and the late-flowering kinds by themselves, and not in the same bed. When a bed of tulips is in bloom, every flower should be open at the same time; also with both hyacinths and tulips, the flowers should all be of an even height, to secure which the bulbs must be planted of an even depth.

White Hyacinths

Beds of jonquils and daffodils are also very effective, and the bulbs require to be planted the same distance apart and the same depth as hyacinths. Crocuses, scillas and other small bulbs are more suitable for narrow borders than formal flower beds. They should be planted three inches apart.

Although fall bulbs are quite hardy, yet sometimes during the winter we have sudden thaws sufficient to excite the bulbs to grow. To prevent this, when planted in beds it is better to give them a light covering of partially decayed leaves or light mulch about two inches deep, but it should not be put on till after the ground is frozen hard, for if placed on before this mice will often nest under it and take their meals out of the bulbs. When planted in wild or semi-wild situations the natural covering of leaves and grass is sufficient.

Many people discard their tulips and hyacinths after the season of flowering is past, as they never give the same satisfaction a second season. If one has not the heart to do this, and the beds are wanted for the summer bedding plants, the bulbs should be carefully lifted, the flower stalks cut off, and the bulbs planted again closely in shallow trenches in some shaded, secluded place where they may finish ripening their foliage and may rest until fall. They may then be lifted and planted in irregular shaped colonies in the mixed flower border, where they should remain permanently. Daffodils, crocuses and other bulbs do better if they can remain in the beds when once planted, but if the beds are wanted for summer-flowering plants the bulbs may be treated the same as tulips and hyacinths.

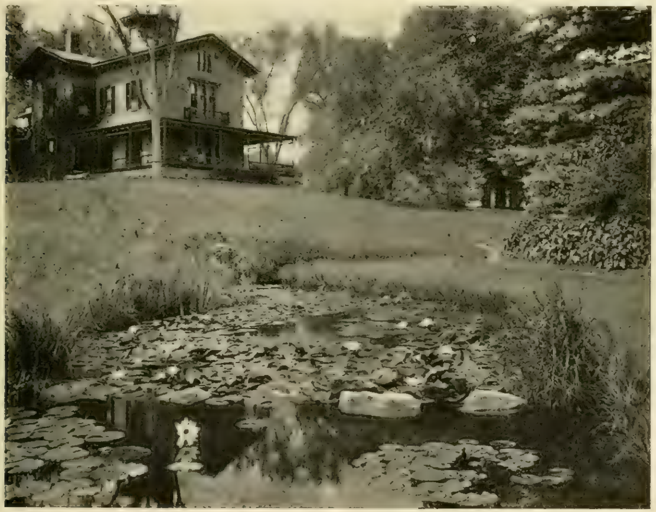
Almost all bulb catalogues designate the kinds most suitable for bedding, together with the colours, single or double, early- or late-flowering, and quotations per dozen, per hundred, and per thousand; and while the best prices will, of course, secure the best quality of bulbs, which will produce rather the largest flowers, yet I do not ever remember to have seen a poor variety of any of the fall bulbs.

CHAPTER VIII

THE WATER GARDEN AND THE MOSQUITO PROBLEM

BY WILLIAM LYMAN UNDERWOOD

SOME years ago, in a low-lying meadow near my house, in Belmont, Massachusetts, I made an artificial pond in which to grow water-lilies—a modest affair seventy feet in length, and varying in width from five to fifteen feet. Here I planted several different kinds of hardy pond-lilies and other aquatic plants, some of which bloom from May until October. The venture has been so successful, and the little sheet of water has added such a charming feature to the landscape, that I am tempted to



Copyright, 1902, by Wm. Lyman Underwood

A bit of Mr. Underwood's water garden, showing its relation to the house

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"The margin was well sodded, in order to secure a firm and moderately dry edge"

tell my experience as an amateur water gardener, that others may, if they wish, go and do likewise.

The meadow where the pond is situated was rather damp, and at times quite wet and boggy. The soil is a black and heavy peaty loam, with a subsoil of gravel and fine blue clay. This particular spot was naturally so wet and difficult to drain thoroughly that it seemed admirably adapted for this purpose, especially so as it was well protected at the north from the cold winds by a heavy growth of willow trees; while nothing intervened to the south to cut off the sun's rays, which shone all day upon it.

With these natural advantages in my favour, the work of building the pond seemed already well begun. In order to clearly show the outline, and to form some idea of what the shape ought ultimately to be, to conform with the lay of the adjoining land, stakes were driven into the ground at intervals of every two feet along the prospective margin, and the excavation of the soil was begun. Through the center of the pond the dirt was removed to a depth of five feet, well down to the gravel and clay. During the work of excavation, three blind or stone drains were encountered. They led into a meadow brook which flows close by, and, fearing that perhaps they might at times drain off the water from the pond faster than it would come in, particularly as the brook, only forty feet away, is nearly three feet below the level of the garden, and to guard against any possible loss of water in this way, the whole bottom of the pond was covered with four inches of well-puddled clay. This measure, of course, while it prevented any water from escaping, also served to keep out all ground water. So, not wishing to depend entirely upon the rainfall for a supply, a line of two-inch iron pipe was laid from the pond, up to the bed of the small brook several hundred feet, to a point where a small dam held the water back about a foot above the level of the garden. This gave an abundance of water at all times, though all that is necessary is just enough to keep the pond fresh and make up for any evaporation.

At times it may become necessary to draw off the water from the garden, in order to set out new plants or to remove some varieties that are growing too fast and crowding out others. In order to accomplish this, a discharge pipe was run into the bed of the brook, and at its upper end was fastened

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So near and yet so far

into the bottom of a small tub placed in the deepest part of the pond, the tub being used to keep the mud away from the outlet and so prevent the pipe from being clogged. For an overflow, a brass standpipe was fitted into the outlet, and in order that the water might be kept at any desired level, this pipe was made in several sections which fitted one into another, and by putting in or taking out a number of sections the depth of water is easily controlled.

Everything being in readiness, about eighteen inches of soil was replaced over the lining of clay, the slope of the bottom being made very gradual, particularly along the shores, that the conditions might be favourable for the growth of suitable marginal plants. On top of this natural soil was placed a foot of compost, made by thoroughly mixing two parts of the richest loam with one part of well-rotted cow manure. The balance of the excavated dirt was graded back upon the high land which formed the south shore of the pond. The land on the north, or lower side, was left at its original level, and by this treatment a most natural effect was secured. The entire margin was well sodded, in order to secure a firm and moderately dry edge,

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Our friends the frogs

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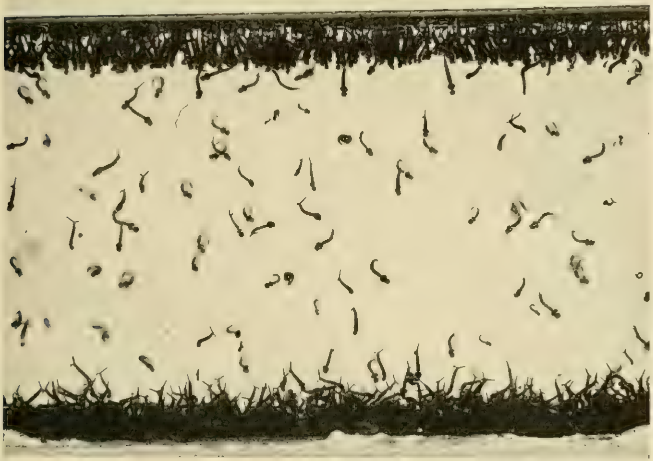
"All along the farther end were grouped masses of large Japanese iris to serve as a background for the water-lilies"



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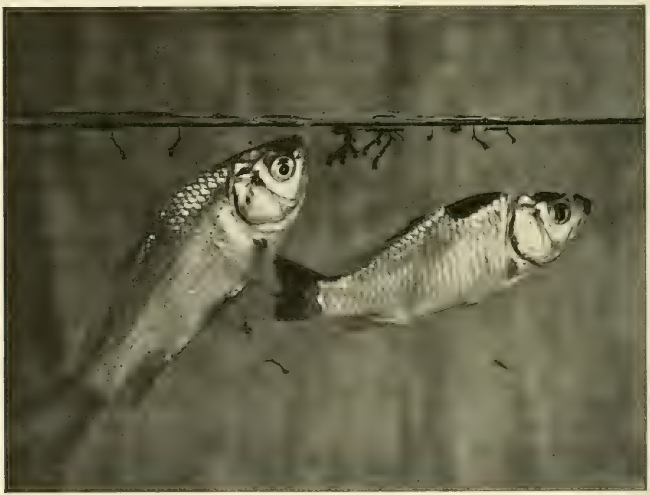
How mosquitoes breed in the absence of the goldfish

and a row of stepping-stones was placed between the outlet and the shore, thus bringing the overflow pipe within easy reach.

Along the lower margin were set out marsh marigolds, and forget-me-nots, and different varieties of water-grasses. Arrow-head and pickerel-weed were also started along the grassy border, and all along the farther and broader end of the pond were grouped masses of large Japanese iris, to serve as a background for the water-lilies, which were to be the principal features of the water garden. When ready for planting, the water was drawn out of the pond until only a few inches remained. Planks were then placed upon the bottom, and, walking out upon them, I set out the lilies, pushing the rhizomes firmly down into the muddy soil.

After the plants were all in place, in order to keep the water as warm as possible until the new growth began, the pond was kept about half full. Then, as the tender foliage started and the lily-pads came near the surface, the level was raised a few inches at a time. Where it is not practicable to control the garden in this way, the rootstocks may be pushed down into the mud with a long pole; but the growth will be much more rapid and vigorous if, at the start, the water can be kept quite shoal and warm. The pond was first planted in May, and by the middle of August the lilies were well in bloom. They may be set out at any time during the summer, but an early start is necessary if they are to flower the same year.

There is another important and interesting feature of this pond that is of special significance: it has become the home of a large number of beautiful goldfish that have thriven and multiplied in its waters ever since the pond was started eight years ago. It is not generally realised, as it should be, that goldfish will live in our natural northern waters; for, as I shall show, their presence in many small ponds may be of vital importance to us. It is now known that a certain mosquito conveys from man to man the germs of malaria and yellow fever, and it has been found that water is absolutely essential to its life in the earlier stages. The mosquito lays its eggs upon the surface of some quiet pool, where, after a few days, they hatch out, filling the water with thousands of "wigglers," or larvæ, and after another transformation eventually become the adult mosquito. To exterminate the mosquitoes, we must destroy their breeding places. Fill up or drain off the pools where the "wigglers" are to be found and, where it is not practicable



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Goldfish feeding on mosquito larvae

to adopt either of these methods, cover the surface of the water with kerosene oil, thus cutting off the supply of air from the larvæ and smothering them.

But what shall we do with the water garden, which appears so perfectly suited for raising mosquitoes? Shall we fill it up, drain it off, or pour oil upon its troubled waters? If his pond should prove as great a source of pleasure to the reader as mine has been to me, he will be loath to adopt any of these radical measures. Repeated and diligent search had failed to reveal the presence of any mosquito larvæ in my pond, and this seemed all the more strange when, in the quiet waters of the brook not fifty feet away, I discovered thousands of active "wigglers." Reflecting upon this fact, it seemed probable that the goldfish were holding the mosquitoes in check in the pond, while in the brook the insects were breeding in comparative safety.

To test the correctness of this theory, I took two small goldfish from the pond and placed them in an aquarium where they could feed upon mosquito larvæ and be under observation. The result was as anticipated. Whenever they were dropped into the water the "wigglers" disappeared in short order.

When it is once understood that goldfish are useful, as well as ornamental and comparatively hardy, it is to be hoped that they will be introduced into many small bodies of water, such as lily ponds and water gardens, where mosquitoes are likely to breed. In my experience, these fish can easily be reared in any sheltered pond where the water is shoal and warm.

What country town is there that does not have some swamps containing pools that are difficult and perhaps impossible to drain? Where it is possible, let every swamp be drained; but let no hasty judgment condemn and banish all quiet country pools, for many of them, by proper treatment, can be improved, and made not only wholesome but charming features of beauty in the landscape.

CHAPTER IX

WATER-LILIES AND OTHER AQUATIC PLANTS

BY WILLIAM TRICKER

ANY one who is planning to grow water-lilies will do well to study the conditions under which they thrive in nature. Water-lilies do not grow in every pond; they flourish only in places that are exposed to full sunshine, and which are not subjected to violent freshets or strong springs that keep the water cold even in summer time. Another thing, Nature seldom plants more than one species in one pond. Note also that natural ponds annually receive an accumulation of dead leaves, and that the surface water constantly adds silt, etc., to the accumulation of

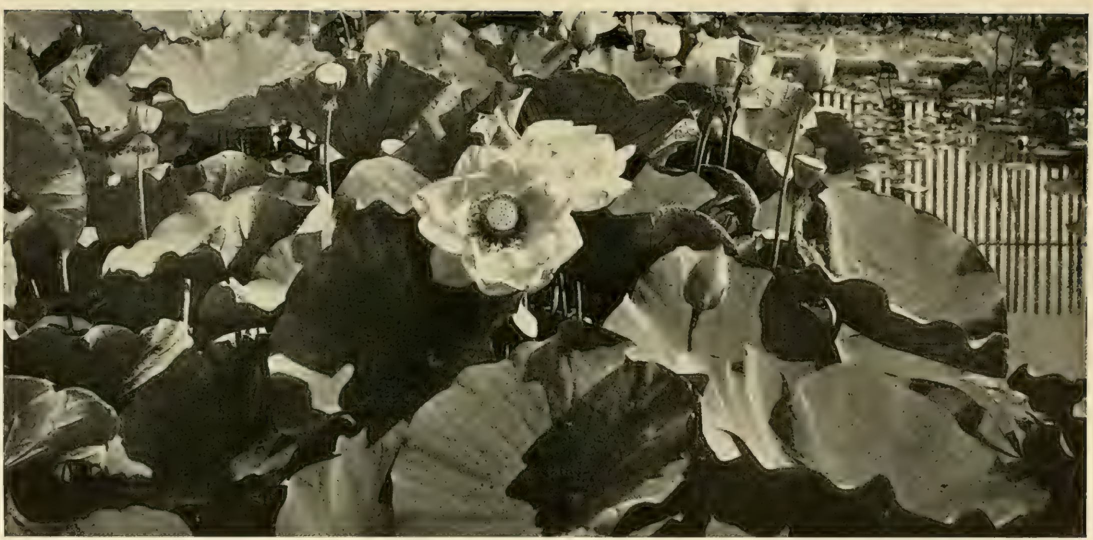
Water-lilies as cut flowers

vegetable matter which furnishes abundant plant-food for nymphæas and other aquatic plants.

The location of the pond may first receive attention. A water-lily pond should be at a convenient distance from the dwelling-house and easy of access. Its near proximity to the dwelling-house can not be considered a menace, since mosquitoes may be kept in check by means of goldfish. If possible, select a site where the ground slopes gently toward the pond; but if the ground is level or nearly so, the soil taken from the excavation may be used to form a bank on one side or end, which, by judicious planting, will present a pleasing and natural effect. The water-level of the pond should be a few inches below the ground-line.

Having selected the site and decided as to the shape, it will be a wise policy to err on the side of making the basin too large rather than too small. If you have never grown water-lilies and do not know what "tropical vegetation" means, it will be difficult for you to realise how much space should be allotted a given number of plants. It is one of the commonest mistakes to crowd a great many plants into a little pool. Three water-plants are put into an ordinary tub, where there is not sufficient space for one. Of course there is a limit to the size of a pond, but I would suggest going to the extreme; it is far better than having to enlarge afterward, or having to content oneself with a pond that is too small. However, I should not advise any one to make a pond so large that it will be out of proportion with the rest of the garden.

The best way to make a pond will in most cases be the simplest and the most nature-like. Study the existing conditions in every case, and make use of the materials at hand. Clay, gravel, rough stones or bricks may be used for construction. Puddled clay will make a water-tight basin. The clay should be at least four inches thick on sides and bottom. If boxes or tubs are to be used, the bottom should be covered with sand, otherwise the soil may be placed on the clay bottom. Cover the sides with sod. There is much labour in constructing a pond of clay, and, although it may appear cheap, I would not recommend this method of construction unless the clay can be had for the digging and all hauling can be done without hiring teams. Gravel and like materials that can be used as concrete will answer the purpose well. The sides and bottom should be covered with four inches of the same, with a facing of Portland cement an inch thick. Rough stones laid in cement may also be used for the same purpose. The walls should be about eight



The so-called "Egyptian" lotus (known to the trade as Nelumbium speciosum). Note that the leaves rise well above the water, while those of a nymphaea float upon the surface. The plant here pictured is the Indian lotus, or Pythagorean bean; the true Egyptian lotus, Nymphaea lotus, is practically not in cultivation

Lotus in a farmer's yard

inches thick, and finished with a facing of Portland cement; the bottom should be constructed in like manner. When the above-named materials are used, the sides should be flaring. The depth when finished should not be less than two feet. The ground should by no means be new or made ground. A water-lily basin needs a solid substratum, so that settling in any part is out of the question, for should there be a leak the consequences will be disastrous. The best and most practicable method is to construct the basin of brickwork. This work may be entrusted to a local bricklayer, and an approximate cost can be given or ascertained beforehand. The walls should be eight inches thick, built perpendicular. The joints should be all well filled in as the work proceeds. The wall may be tapered near the top, finishing with a four-inch brick laid flat. The walls on the inside, as far as they are tapered, should receive an inch-thick plaster of Portland cement. The bottom, or floor, may be grouted or laid in with brickbats or whole bricks, and should afterward receive a good facing of cement.

Before anything is done in the way of construction, the water-supply must be assured, especially if there is danger of prolonged drought. Provision must also be made against a freshet after heavy rains, in case the pond is

The white water-lily of the South, as it grows at State Line, Miss., in a pond fifty by one hundred and twenty feet, belonging to Mrs. M. S. Gaines

fed by a stream; otherwise the occupants might be swept clean out of the pond, or buried under a mass of sand or other material carried along by the freshet. In all artificial basins an overflow should be provided, to serve the double purpose of overflow and outlet. The size of the pipe may vary from two to four inches, according to the size of the pond. A four-inch pipe is large enough for a pond of five thousand superficial feet. A smaller pipe than two inches would carry off the surplus water of a small pond, but it is liable to become choked with light floating matter. The overflow pipe should be made in at least two sections, with screw joints, an elbow terminating the outlet and level with the bottom of the basin, or slightly depressed, the overflow pipe being fitted into the latter and terminating with a collar. Never plant a newly constructed basin or pond built of masonry or concrete without giving the same a thorough soaking and change of water; otherwise, the caustic property of the cement will destroy the plants, fish, or any living thing.

The selection of varieties requires much careful consideration. Not all nymphæas are adapted for every mode of culture. For example, any one who selects for tub culture such a rampant grower as *Nymphæa tuberosa* is sure to be disappointed. It is difficult to give advice, because individual tastes must be consulted. Some prefer decided colours, others white or pink, or yellow shading to red. The locality and section of the country must also be taken into consideration. In the northern and eastern States and mountainous districts better results are obtained from the hardy nymphæas and nelumbiums. The season is often short for the latter, and tender nymphæas, if grown at all, should be extra large plants; as it is not safe to plant out before June 1st, and in some sections not before June 10th. In such cases it is better to confine the selection of tender nymphæas to the day-flowering kinds. Around New York City and south and southwestward any species or variety can be grown. A selection may be made comprising all nymphæas, both hardy and tender, day- and night-flowering, nelumbiums victorias, and miscellaneous plants. The season begins in April, and by the latter end of the month *Nymphæa Laydekeri rosea* is in blossom. The latter can be relied upon every time; it is not only the first—it is also the last of the season. Some of the hardy nymphæas are short-lived, or rather the season of flowering is short—*e. g.*, the Cape Cod pink pond-lily, *N. odorata rosea*. In fact, the typical *N. odorata* and its numerous hybrids, together with *N. tuberosa* and its forms, are also short-lived. Their season is on the wane by the Fourth of July. Although the European varieties hold out longer, the flowers are much smaller, and colours begin to fade. But by Independence Day the nelumbiums in many shades of colour attract our attention, as do also the tender nymphæas. From July until September the tender nymphæas, with their gorgeous colours and gigantic size, dominate the water garden, and the hardy ones still remaining in blossom are almost totally eclipsed by their Oriental brethren.

An aquatic basin twenty by fifty feet will afford a superficial space of one thousand feet. The soil in which the nymphæas are to be planted may be placed directly on the bottom, or, better still, boxes three to four feet square and one foot deep may be used instead. The soil should be a moderately stiff, fibrous loam, and thoroughly rotten manure, one part manure to two of loam, the whole being composted, if possible, in the fall for spring use In a pond of the above dimensions ten plants of tender nymphæas will cover the whole surface. It is not unusual, in the region of Philadelphia, for a single plant of the night-flowering varieties to measure twelve feet across. Thus, allowing each plant its individuality, six plants of tender nymphæas will suffice for such a pond. But supposing the pond is planted with hardy nymphæas, it would require three of the latter in place of one tender nymphæa—at least for the first season, if immediate effect is desired. Instead of planting in clumps of three, any one who prefers variety may set one plant each of twelve distinct varieties. Hardy and tender nymphæas may be grown in the same pond, if desired; also lotus in variety. The latter must necessarily be confined to a given space, being grown either in a large tub or in a walled-in section.

Pitcher plant in flower (Sarracenia purpurea). This plant may be naturalised at the side of a pond

The following twelve hardy nymphæas represent the best (regardless of their selling prices) adapted to an artificial aquatic basin, the best six being marked with a*: Arethusa, Andreana, Gloriosa, *James Brydon, *Marliacea albida*, **Marliacea chromatella*, **Marliacea rosea*, *Marliacea flammea*, *Marliacea rubra punctata*, Robinsoni, *William Doogue, *William Falconer.

Victoria regia in flower (The upturned leaf-margin of the Victoria makes it unique)

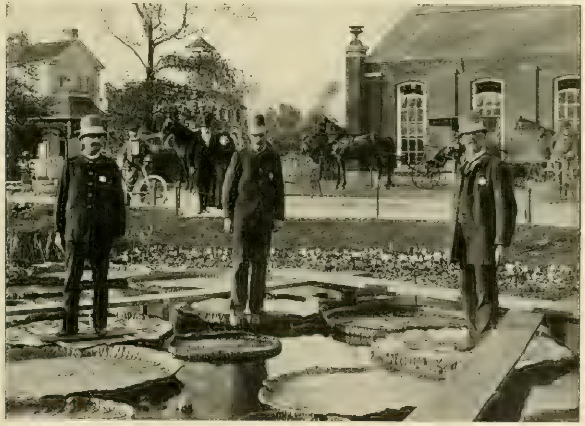
The question may arise as to the omission of such grand varieties as *N. Gladstoniana*, *N. tuberosa Richardsonii*, and *N. odorata Caroliniana*. They are out of place in an aquatic basin of ordinary size, because their growth is too vigorous; they are better adapted to the natural pond, and to places where they do not require to be replanted periodically. Other charming varieties, such as *N. Laydekeri rosea*, *N. helvola*, etc., are also omitted; they are so small that they are better adapted to small pools, fountain basins, and tubs. However, they may be planted in the same pond with strong-growing species, provided there is a suitable corner where the more vigorous plants will not encroach upon their domain.

If any one wants twelve tender nymphæas, six of them being day-flowering and six night-flowering, I should recommend: *N. Capensis*, blue; *N. gracilis*, white; Mrs. C. W. Ward, pink; *N. pulcherrima*, blue; Wm. Stone, blue; *N. Zanzibarensis rosea*, pink; *N. dentata*, white; George Huster, crimson;

Frank Trelease, crimson; O'Marana, pink-red; Jubilee, white; *N. rubra rosea*, carmine.

Nelumbiums are all good, and all require most liberal culture to obtain the best results. Those of decided colours are: *N. album grandiflorum*, white; *N. kermesinum*, pink; *N. roseum*, deep pink. The most vigorous and commendable varieties are: Shiroman, white, double, extra choice; *N. Pekinensis rubrum*, brilliant rosy carmine, large and handsome, and its double counterpart, *N. Pekinensis rubrum plenum*. The forms of *N. pygmæa* are beautiful, but they do not command attention beside the nobler species of the type.

As tub plants the tender nymphæas are disappointing, because they are such rampant growers and feeders that, when confined to the limits of an ordinary tub or half-barrel, they are soon starved almost to death. The small quantity of plant-food is soon exhausted; the leaves assume a sickly yellow-green colour; and tubers are actually found in summer, when the plants should be in vigorous condition and producing flowers in abundance. If tubs are used at all, have such as will measure three or more feet in diameter.



The wonderful sustaining power of Victoria regia. Missouri Botanical Garden St. Louis

Anticipate the wants of the plants, and if the plants are vigorous give them a liberal supply of liquid manure occasionally. They revel in our warmest summer weather, and are quite at home in the Victoria pond at a temperature of eighty-five to ninety degrees. Many failures occur through early transplanting. The check caused by digging, shipping, etc., which cannot be avoided, together with the change of temperature and exposure, are responsible for numerous losses which the vender is unjustly expected to shoulder. The proper time to plant nelumbium tubers is when the prevailing conditions of the weather are conducive to immediate growth. Bear in mind that tender nymphæas do not start into growth with the hardy kinds, and require different treatment.

A small water-lily pond in a suburban yard at Bond Hill, near Cincinnati

Victoria regia is, indeed, the "royal" water-lily, and, under proper conditions, is of easy culture. It is not a native of North America, and cannot be grown as a hardy water-lily. It requires artificial heat. Some growers believe the Victoria can be grown in a natural pond as well as a tender nymphæa, but very few if any such cases are in evidence. The first on record was grown in North Carolina, and even there it was not safe to plant before the latter part of June. Occasionally plants will succeed in aquatic basins in and around Philadelphia without artificial heat, but the seasons are uncertain, and the results may more frequently be failure than success. In localities where the summer days and nights are hot, as in St. Louis, Victorias can be grown successfully without artificial heat. In altitudes where cool nights are experienced in summer, it is useless to try to dispense with artificial heat. The only royal road to success with *Victoria regia* is to grow it in an artificial pond where heat may be applied during the early season. A temperature of eighty-five to ninety degrees must be maintained. By the end of June matured plants are in evidence, which will withstand a lower temperature with impunity; but, as a rule, we have warm weather during July and August, and the plants continue growing and flowering. The end of June is about the right time to plant *Victoria regia* without artificial heat, but it will be August before the plants arrive at maturity, when the season is also well advanced.

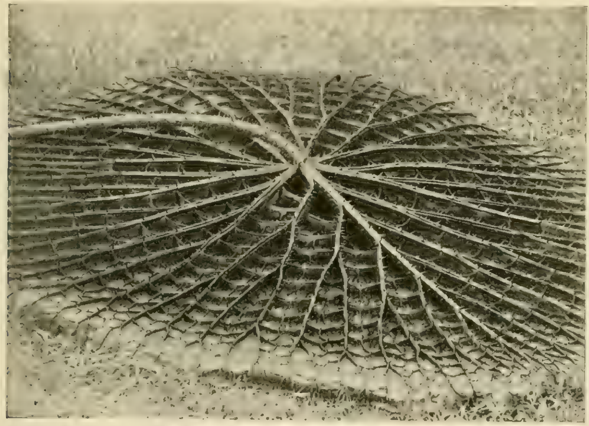
Another view of the same pond

Victoria Trickeri succeeds best in a temperature ten degrees lower than *V. regia*, and is often difficult to raise. It is ruinous to seedlings, if they are at all late, to try to force them. The growth will be soft and liable to attacks of plant-lice, and when plant-lice take up their abode on a young leaf and remain unmolested the plant is soon crippled for life. The seed of *V. Trickeri* germinates in a temperature of from sixty-five to seventy-five degrees, and seventy-five to eighty-five degrees is the limit. Every precaution must be taken against greenfly, and there must be an abundance of light and ventilation as long as the plants remain under glass. Plants may be set out in the open with more certainty of success than with *V. regia*, but seldom before the end of June. However, if a temperature of seventy-five can be assured before then, it is safe to plant out Victorias. When an artificial temperature of eighty degrees can be maintained, even if it is by the middle of May, plant out in summer quarters, and by the end of June it will be safe to remove all protecting devices, such as steam pipes, frames, or sashes.

Nymphæas, nelumbiums and Victorias are the favourites, but there are numerous other plants that deserve attention and which add considerably to the general appearance of a water garden. Where an assortment of nymphæas is planted, the tender or tropical varieties break the monotony by throwing their flowers well above the foliage, although this feature is objectionable to some because it is so unlike the habit of our native pond-lilies. Something strong-growing and tall is really needed. Clumps of papyrus can be grown on the margin of the pond. Their tall, graceful plumes are unequalled by any other aquatic or subaquatic plant. The umbrella plant, *Cyperus alternifolius*, is another useful plant. The hedychium, or butterfly lily, with its canna-like foliage and white flowers, is worth growing; also the giant arrow-head, *Sagittaria Montevidensis*, *Sagittaria falcata*, and *Jussiæa longifolia* are very desirable plants. These are all tender, and need the protection of a greenhouse or warm shelter in winter.

Among hardy plants I would mention *Sagittaria Japonica fl. pl.*, *Acorus Japonicus variegatus*, *Typha latifolia*, *Pontederia cordata*, and *Lythrum roseum superbum*.

A few of the minor aquatic plants may also find shelter in the large aquatic basin, but they must be watched carefully, for, although they are diminutive, they are rapid growers, soon interfering with the development of the nymphæas if not kept in bounds. The water hyacinths, *Eichhornia crassipes major* and *E. azurea*, are more curious than beautiful. The water-poppy, *Limnocharis Humboldtii*, is a very striking yellow flower, and blooms profusely, but it grows prodigiously, and will soon fill a pond. The water-snowflake, *Limnanthemum Indicum*, is another very attractive plant, with pure white flowers covered with hirsute glands, giving it the appearance of a flake of snow. Like all limnanthemums, or "floating hearts," the flowers are produced on the petioles near the leaf; after several flowers are produced, a runner with another leaf and bunch of flowers follows, and so on, and very soon a large surface is covered. These and many other plants are interesting, but because of their wild and rambling habits I prefer to keep them out of the pond where choice nymphæas are grown.


Under side of a Victoria leaf, showing the beautiful venation and the spaces where air is held

A very useful and desirable plant to grow, and one which can be had in flower in winter in a small space, is the cape pond-weed, *Aponogeton distachyum*. It is perfectly hardy, and one of the first to put in an appearance in spring, but during hot summer weather it is liable to rest. The flowers are white, borne on a forked spike, and very sweet-scented.

I may also mention here another tender aquatic plant that is travelling northward and proving itself hardy, and where so it is liable to become a pest, viz., the parrot's feather, *Myriophyllum proserpinacoides*. When grown in a large tub on a pedestal or a vase, where its branches can droop over the edges, it is a handsome plant; but on the margin of a pond, stream, or ditch, where the ground is wet or water shallow, it is of marvellous growth. The reason why these plants are seldom seen in such a luxurious condition is that people attempt to grow too many plants in a small pond or even in a tub, and consequently they are starved.

Many other plants that are subaquatic are deserving of general culture, but as yet are rarely seen in the garden, their proper place being the "bog garden." Many odd and curious yet beautiful plants are met with in this group—sarracenias, or pitcher plants, the *Darlingtonia Californica*, *Drosera* or sundew in variety, the marsh marigold (*Caltha palustris*), and its double form, the dainty myosotis, or forget-me-not, *Menyanthes trifoliata*, *Calla palustris*, *Helonias bullata*, *Lobelia cardinalis*, spireas in many forms, *Calopogons*, and the queen of hardy orchids, *Cypripedium spectabile*. Ferns, too, are capital for such places. The "bog garden" seems to be an English idea, and a good one, too, but we have never heard of any notable example of it in America.

CHAPTER X

ROCK GARDENS AND ALPINE PLANTS

BY EDWARD J. CANNING

SOME of the most exquisite gems in the vegetable kingdom grow above the tree-line on mountains. These alpine plants are of low and compact growth, herbaceous or succulent in character, and produce flowers of exquisite beauty and colouring. They grow in crevices or in pockets, often overhanging and completely carpeting projecting ledges of rocks. The attempt to cultivate these plants has led to the making of rock gardens, where they can be provided with all the conditions under which they grow naturally, except, of course, altitude, which is of the least importance. Many of the rarer alpine plants cannot be grown successfully unless these conditions are given. But a rock garden may be made to provide a home not only for true alpine plants, but also for a large number of interesting plants of small stature from much lower altitudes. A well-constructed and tastefully arranged rock garden can be made one of the most interesting features of a country home. Meaningless mounds of stones too often seen in gardens and in public parks are by no means the best conception of a rock garden.

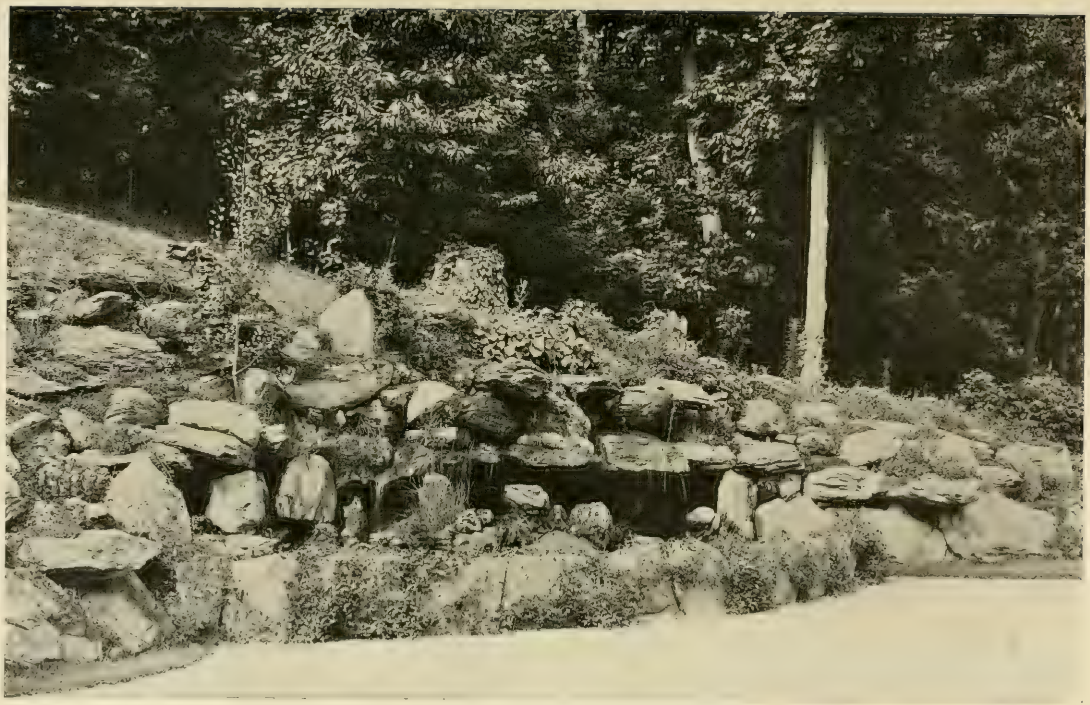
The rock garden should be a close imitation of a rocky mountain, though, of course, on a smaller scale. It should have crevices, pockets, and overhanging ledges, and these should be filled with soils to suit the requirements of the different plants; some need loamy or peaty soils, while others require a large proportion of crushed rock. As few gardens contain a natural rocky bank or hillside, most rock gardens are, therefore, "artificial," in the sense that they are made by man, but there is no form of gardening in which one has more opportunity to give expression to his natural taste than in the construction and planting of a rock garden.

There are two kinds of construction, the "open" and the "underground." The open rock garden is made from a natural bank or hillside, and very attractive it can be made, especially if the bank or hillside skirts a lawn and is entirely free from the roots of large trees.

The "underground" rock garden implies a cutting made below the natural level of the ground. This method is adopted when a garden does not contain a natural bank or hillside. The site chosen for an underground rock garden must, of course, be governed by circumstances, but, if possible, it should be in a secluded portion of the grounds, and near the boundary rather than in the center of an open place, if it can be avoided. The size should then be determined and the top soil all removed for replacing when the cutting is complete. There should be a central path of not less than five feet in width, and this should wind in such a manner that the cutting shall produce a variety of aspects to suit the requirements of the different plants. The cutting should begin at one end, being shallow at first, but gradually deepening until it is six or eight feet below the ground-level. All the soil taken out should be placed above the sides of the cutting, to still further increase the height from the path through the center.

The cutting should not be made regular, or smooth, but should present an uneven surface, with occasional mounds and depressions of various sizes. After the rough outline is formed, the top soil should all be placed evenly over the whole surface. The rocks may be then placed in position; the kinds used do not greatly matter. Sandstone is perhaps best, though very beautiful effects may be made with common boulders. Cut stones or stones with flat surfaces should not be used, as they detract from the natural appearance a rock garden should possess. The rocks should be of various sizes, and arranged so that their most rugged sides are seen. Like the rocks on the mountainside, they should occasionally stand out boldly, almost perpendicularly with the edge of the path, then withdraw into hollow recesses; but they should always provide crevices, pockets, and ledges for the reception of the plants. If a rock garden is extensive enough, a cascade will greatly add to its attractiveness. Rugged stone steps leading up to a sinuous path among the rocks on the upper part of the rockwork, with seats placed at intervals, may be introduced, and will add greatly to one's enjoyment of it.

Spring is perhaps the best time for planting the rock garden, though early fall is also good. The pockets and crevices should be so arranged that the water does not run off too readily; at the same time it is necessary that they should have good drainage, if the soil below the rocks is of a clayey nature. They should be well filled with soils to suit the requirements of the different plants. For members of the heath and orchid family a peaty soil is best; for the mossy and starry saxifrages, low-growing sedums, and



An "open" rock garden on the Stokes estate at Lenox (see page 161)

sempervivums, and plants of a more or less succulent character, a soil largely composed of crushed rock or gravel is best. Plants belonging to the primrose and lily families will do best in a soil consisting largely of leaf mould, while for the cruciferæ, compositæ, and most other families, a good loam is all that is necessary.

It is a mistake to plant a rock garden too thickly. Each plant should have ample room to develop without encroaching on its neighbour, and those plants which have a tendency to spread unduly, or cannot easily be kept in check, should be rigidly excluded from the rock garden, no matter what other good qualities they may have, for it is difficult to eradicate them from a rock garden when once they are established.

The matter of exposure requires careful study. The true alpines are better confined to the northern or northeastern aspects, where they would be protected from the midday sun. Plants of a succulent nature, such as the low-growing sedums, may occupy the sunniest positions. The more delicate alpines, such as the alpine primulas or androsaces, should be planted in sheltered nooks. Cerastiums, aubrietras, dwarf phlox, and plants of a similar habit, should be planted to overhang ledges of rock, while the starry saxifrages and sempervivums may occupy holes or crevices in the rocks. For the steepest places, or where it may be difficult for some plants to obtain a foothold, the wild ginger, *Asarum Canadense*, *Arenaria* Balearica, or plants of a like habit, are excellent. On the top of the rocks, at the most conspicuous points, or at the turn of the path, may be located such stately plants as *Acanthus mollis*, *Spiraea Aruncus*, or a small group of *Aquilegia Canadensis*. A small border, varying in width, and edged with small rough stones, looks well at the foot of the rocky slopes, and not only serves as an edging for the path, but will accommodate many plants, such as the dwarf composites, ajugas, or Iceland poppies.

Spring-blooming bulbs may be planted in masses among the plants, such as narcissus, scillas, snowdrops, chionodoxas, grape hyacinths, and crocuses. These blossom early and do not interfere with the regular rock-garden plants. Tulips and Dutch hyacinths should never be planted in a rock garden; such highly developed forms are out of place as much as a Japanese chrysanthemum would be in a wild garden.

The whole rock garden should be enclosed with either flowering shrubs or evergreens planted in masses. These give seclusion and shelter from cold winds, and in their shade native ferns may be planted.

The approaches to a rock garden should not be too abrupt; a few rocks placed outside along the path leading to the rock garden, and also among the shrubs which enclose it, help to give it a much more natural appearance

The propagation of alpine and other plants suitable for rock gardens is simple. All may be raised from seeds, and most of them by cuttings or division of the plants. The writer raises his plants from seeds sown in February, in four-inch pots of light sandy soil, in a warm greenhouse. The seedlings are transplanted as soon as large enough to handle, and gradually given more air as they increase in size. By the end of April they are usually large enough to plant out permanently in the rock garden. If one does not have a greenhouse, the seeds may be sown in a coldframe, in shallow drills, in April, and transplanted to the rock garden in early fall.

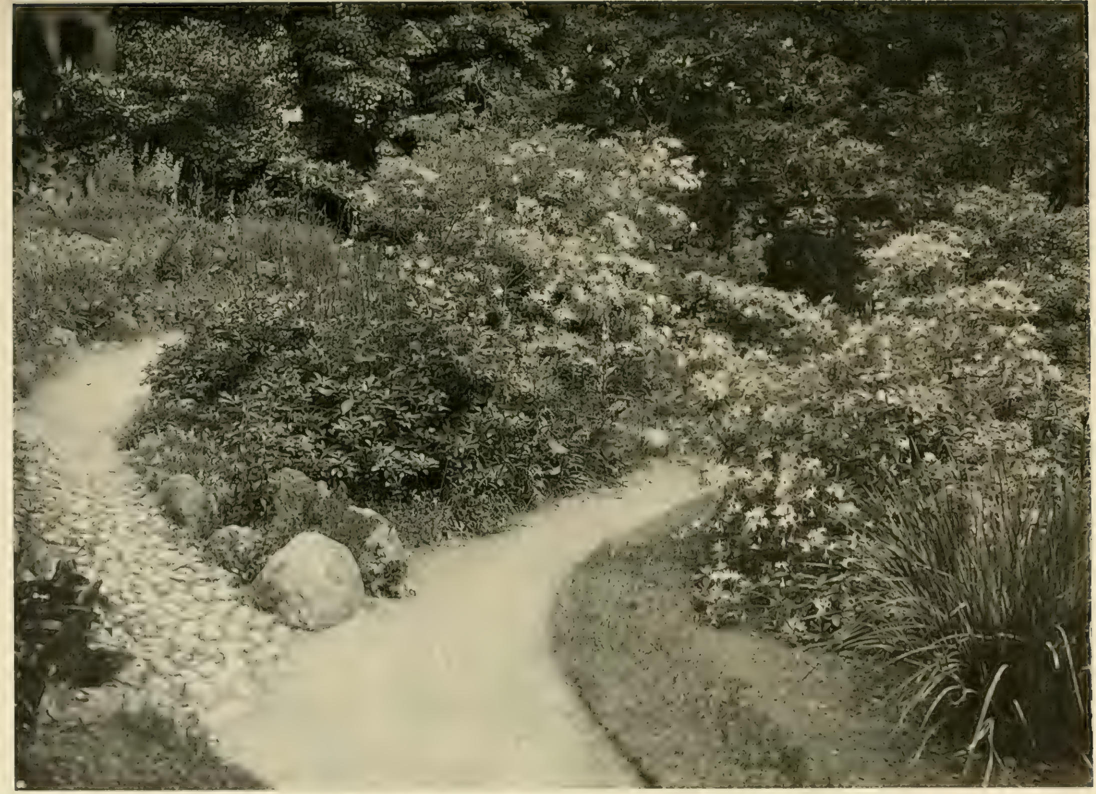
The whole rock garden should be replanted and given fresh soil about every four or five years. The general care required is usually less than for an ordinary flower garden. In dry weather in summer the plants should receive water at least once in two days, and in winter the plants which overhang ledges of rock should be protected with branches of hemlock or pine.

Following is a list of some of the plants most suitable for a rock garden, the majority of which the writer has proved to be hardy in New England.

SOME OF THE BEST OF THE TRUE ALPINES

Androsace alpina
“ sarmentosa
Anemone alpina
Antennaria alpina
Aquilegia alpina
Armeria alpina
Cerastium alpinum
Cheiranthus alpinus
Campanula Garganica
“ muralis
“ pulla
“ rotundifolia
“ turbinata
“ Waldsteinii
Dianthus alpinus
“ glacialis

Gentiana verna
Geum montanum
Globularia nana
Leontopodium alpinum (Edelweiss)
Linaria alpina
Lychnis alpina
Potentilla aurea
Primula Mistassinica
Reseda glauca
Saxifraga cæsia
“ Cotyledon
“ “ var. pyramidalis
“ crustata
“ geranioides
“ longifolia
“ oppositifolia



A glimpse of the rock garden at the home of Professor Charles Sprague Sargent

Dianthus petræus
Doronicum glaciale
Draba alpina
Epimedium alpinum

Silene acaulis
Soldanella alpina
Veronica alpina

Plants for Overhanging Ledges

Ajuga Genevensis
“ reptans
Antennaria plantaginea
Anthemis nobilis
Arabis albida
Aubrietia deltoidea
Cerastium Bierbersteinii
“ purpurascens
“ tomentosum
Daphne Cneorum
Linnæa borealis var. Americana
Mitchella repens
Phlox reptans

Phlox subulata alba
“ “ atropurpurea
Sedum acre
“ album
“ Hispanicum
“ purpureum
“ Sieboldi
“ “ var. variegatum
“ ternatum
Stellaria graminea
“ Holostea
Veronica rupestris
Vinca minor

Plants Most Suitable for the Deepest Recesses

Anemone Japonica
Convallaria majalis
Cornus Canadensis
Cypripedium parviflorum
“ pubescens
“ spectabile
Dicentra spectabilis
Dictannus albus
Funkia lancifolia
“ “ var. albo-marginata
“ ovata
“ Sieboldiana
Helleborus niger

Lobelia cardinalis
“ syphilitica
Orchis latifolia
Pachysandra terminalis
Polygonatum biflorum
Saxifraga crassifolia
Tiarella cordifolia
Trillium cernuum
“ grandiflorum
“ sessile
Uvularia grandiflora
Viola Canadensis
“ striata

Plants for Conspicuous Positions

Acanthus mollis

Acanthus candelabrum

Aquilegia Canadensis
“ cærulea
“ Olympica
Dictamnus Fraxinella
Digitalis purpurea
Eryngium planum
Fritillaria imperialis
Lychnis Chalcedonica
Papaver nudicaule
“ orientale
Spiraea Aruncus
Verbascum Chaixii

Plants to Be Used in Pockets

Achillea tomentosa
“ Ptarmica var. flore pleno
Adonis vernalis
Allium Moly
Alyssum argenteum
“ saxatile
Anaphalis margaritacea
Anemone patens var. Nuttalliana
“ Pulsatilla
Arenaria Balearica
“ graminifolia
Armeria maritima
“ “ var. Laucheana
Asarum Canadense
“ caudatum
Campanula Carpatica
“ persicifolia
Ceratostigma plumbaginoides
Colchicum autumnale
Coreopsis rosea
Corydalis glauca
“ nobilis
Cotyledon spinosa
Dianthus atrorubens
“ fragrans
“ plumarius
Dicentra Canadensis
“ cucullaria
Dodocatheon Meadia
Doronicum Caucasicum
Draba incana var. arabisans
Dracocephalum nutans
Epigæa repens
Galax aphylla
Gentiana acaulis
“ Andrewsi
“ Saponaria
“ verna
Geranium Robertianun
Gypsophila repens
Helianthemum lavandulæfolium
“ vulgare
Hepatica acutiloba
“ triloba
Heuchera sanguinea
Iberis sempervirens
“ Tenoriana
Iris pumila
“ verna
Leucojum aestivum
Linum perenne
Lotus corniculatus
Lychnis Viscaria var. splendens
Mertensia Virginica
Oenothera Missouriensis
Ornithogalum umbellatum
Platycodon grandiflorum var. Mariesii
Polemonium humile

A bit of nature-like rock gardening on the Hunnewell estate

Polemonium reptans
Potentilla Sibbaldia
    “ splendens
Primula elatior
    “ farinosa
    “ officinalis
    “ vulgaris
Prunella grandiflora
Pyrola rotundifolia
Rhazya orientalis
Rhexia Virginica
Sabbatia campestris
Sagina procumbens
Saxifraga aizoides
    “ Aizoon
    “ granulata
    “ umbrosa
Scilla Sibirica
Sedum roseum
Sedum spectabile
Sempervivum arachnoideum
    “ fimbriatum
    “ Pomelii
    “ tectorum
Shortia galacifolia
Silene Zawadskii
Statice Gmelini
Stokesia cyanea
Trautvetteria palmata
Trollius Asiaticus
    “ laxus
Tunica Saxifraga
Veronica gentianoides
    “ incana
    “ Ponæ
    “ spuria
Viola cucullata
Waldsteinia fragarioides

PLANTS FOR MOIST PLACES

Calla palustris
Lobelia cardinalis
    “ syphilitica
Myosotis palustris
Parnassia Caroliniana
    “ palustris
Pinguicula vulgaris
Potentilla palustris
Saxifraga Pennsylvanica
Spigelia Marilandica
Spiranthes cernua
Ranunculus flammula

CHAPTER XI

The Home Window Garden

By Edith Loring Fullerton

WE HAVE had only three years' experience in window gardening, and have made no special study of the subject. When my husband and I first became interested, we found great difficulty in getting advice of practical value. The articles we read were either too technical, or so vague and lacking in detail that we decided to go right ahead anyhow, making our own blunders in our own way; and we resolved to have as much "fun" as possible, whatever happened. Our point of view has been expressed by the man of the family in a letter to a friend as follows:

"The pictures which I send you show the entire plants (without any frills or fake), which were raised in this particular window by two 'simon-pure' amateurs, in a cheaply constructed house, alleged to be warmed by a gas-belching furnace during an erratic winter and a phenomenal February, with a further plant-handicap of a new-born babe, which was not only first in our thoughts, but required a high temperature to be maintained by night as well as by day. Our window garden is a two-by-four affair, composed of a couple of greenhouse sash which I screw on in the fall and take off in the spring, and you could buy the whole thing, bulbs and all, I presume, for five dollars."

This is a masculine way of summing up the case. The photographs on pages 179, 180, and 183 are our own pictures of our own plants. If I may paraphrase, "they are poor things, but our own." The other pictures which accompany this description show better plant specimens and greater photographic skill, but the results, I believe, are not beyond the reach of the skilled amateur. Following is a detailed description of our plant nursery:

There are two adjoining windows on the south side of our house giving on to a small balcony. In October we remove the sash from these windows and screw up the window garden. It is really a bulk window with a glass roof; the roof is on hinges, and can be raised to admit of ventilation. The floor of this window is half a foot below the level of the window-sills. A second floor resting on brackets is flush with the sills. This makes an air-space under the pots, which keeps out much of the cold. The balcony also gives good protection, else we should have to take greater precautions against sudden changes in temperature. The only heat the garden receives is from the room. We have had no trouble with the cold, however, but rather the reverse, and have to hang a sheet on the outside of the window to subdue the intensity of the sun.

A succe sful window garden

In the window we have a floor space four feet long by one and a half feet wide. In this we have raised and brought into bloom eighteen pots of bulbs and half a dozen pots of various kinds of flowers.

A good corner of bulbs—hyacinths, tulips, narcissus

Last September we took up such plants from the garden as we wished to bring into the house—heliotrope, begonias, abutilon, ageratum, coleus, and geraniums. The three former were potted and cut way back; the latter were slips. These gave us some flowers while the bulbs were being started. As the bulbs came into the window we relegated the ageratum, coleus, and geraniums to other parts of the house where we have flower-shelves in the windows. We found, also, that the garden was too warm and sunny for

The window garden as seen from the inside

The common heliotrope

A truss of hyacinth

begonias and a little *Primula obconica*, so they went into a northeast window, where they did wonderfully well.

We planted the bulbs in October, and tried to follow the many directions we had read of. "Keep them dark," and "Keep them cool," and "Keep them wet," and "Keep them dry," and "Keep them in the cellar," and "Keep them in the attic," and "Sink the pots in the garden," and "Bury them in moss or sawdust in the cellar," etc.; but unforeseen demands on our time made it necessary for them to take care of themselves. They had

One of the primroses—Primula obconica

A good cyclamen

The Bermuda buttercup (oxalis lutea)—an ideal window plant

one good thorough watering when planted, and were placed on a dark swinging shelf in the cellar. A month later we found them bone dry and no sign of top-growth except one Paper White narcissus.

Root-growth had apparently done very well, so, after watering, the entire lot were transferred to the attic, where they had subdued light. We kept them moist, and they began to grow in a very good succession.

The Paper White narcissi were the first to appear, and we put them for a week or so in a west window before bringing them into the strong sunlight of the window garden. As each kind came along we treated it in the same way, and we had flowering bulbs from December 10th to the middle of May. Our Spanish iris failed to bloom, though we had a splendid crop of foliage (which looked like garlic).

The following is our stock of bulbs: Twelve single Roman hyacinths (pink, blue, yellow, and white), two *Scilla Cubana*, six freesias, three *Narcissus gloriosus*, three *Narcissus Horsfieldii*, four Narcissus Emperor, six

The polyanthus narcissus—Narcissus Tazetta

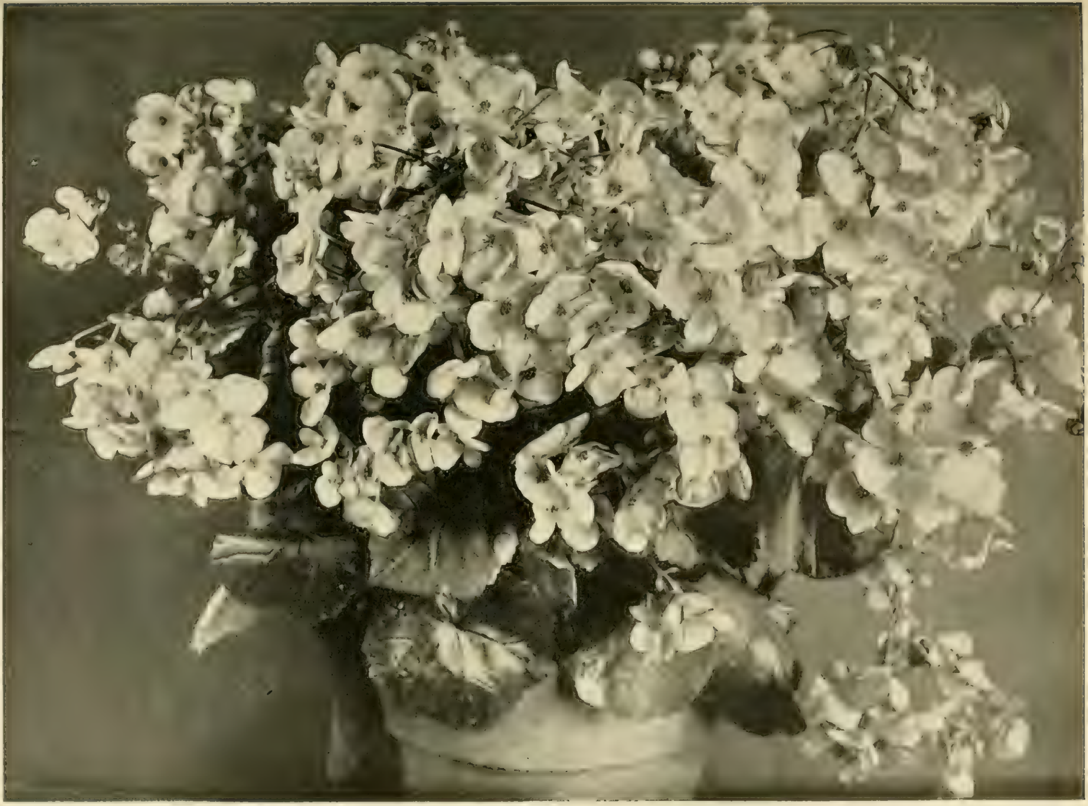
Narcissus poeticus ornatus, six Spanish iris, six Paper White narcissi, six Giant White narcissi, six grape hyacinths, and four cyclamens.

And this was the order and duration of their bloom: Giant and Paper White narcissi, December 10th, for four weeks; white hyacinths, December 20th, for three weeks; cyclamen, January 1st to May 15th; freesia, January 10th, for six weeks; blue hyacinths, January 20th, for two weeks; pink hyacinths, February 1st, for two weeks; *Narcissus gloriosus*, February 1st, for four weeks; yellow hyacinths, February 10th, for two weeks; *Narcissus Horsfieldii*, February 10th, for six weeks; grape hyacinths, February 27th, for three weeks; Narcissus Emperor, February 28th, for three weeks.

We planted the bulbs in pure sandy leaf-mould mixed with a little commercial fertiliser, first placing good drainage (stones) and plenty of charcoal in the bottom of the pot. One season we used garden soil, and were much troubled with caking, worms, and insects. With the leaf-mould we have not been troubled with worms or insects of any kind, and the earth has been perfection as far as consistency goes.

We planted three Roman hyacinths in a six-inch pot (and we learned that it is wise to plant only one colour in a pot, as they bloom at different times), two Horsfieldii, three Emperor, six Poeticus, and six Spanish iris, each in eight-inch pots; three Paper Whites, three Giant Whites, six freesias, and three Gloriosus, each in six-inch pots; six grape hyacinths in five-inch pot, and we found we might just as well have had twelve in the same sized pot. We planted two scillas in an eight-inch pot, and were much interested to see what they would do. The catalogue described them as bearing large clusters of blossoms twelve inches in diameter. When these two bulbs showed seven buds we decided that the entire family would have to move out when they bloomed. It was by planting several bulbs in one pot that we had such continued bloom.

The Paper Whites were glorious, some bulbs sending up three flower-stalks, each one bearing twelve to fourteen blossoms. Giant Whites differ from the Paper Whites only in being a little larger, sturdier, and a little later. The white Roman hyacinths sent up many stalks from each bulb. They have a profusion of leaves quite different from the common hyacinth that one usually sees in the garden. The white was the first to bloom, the blue following, then the pink, yellow, and red. The blue sent its flower-stalks up very high, and the leaves were so long they curled over in many



Gloire de Lorraine Begonia—now a popular winter plant

fantastic ways; the pink had a tendency to bloom in the bulb, and the yellow kept its leaves in a pretty circle around it, reminding one of a canary in its cage. We had one peculiar red one which was bought for pink. It bloomed a good deal like the yellow, only it sent the flowers well above the leaves. The grape hyacinths are like doll-flowers, with their tiny blue bells edged with white.

Cyclamen? Well, cyclamen is a perfect wonder! Last year we had one bulb which produced for us only four blossoms, and as the baby picked two in their infancy our yield was not great. In the spring it was placed by accident among the empty pots on the north side of the house. In August we found it with four new leaves pushing up. It was repotted and placed where the rain could reach it, and left alone until brought in the house. It started to bloom in January, and produced fifty-four elegant blossoms (see page 180). Then there were three little cyclamens besides. One of these had four leaves and twenty-five blossoms. We thought it paid! One bulb lost all its flower-buds

A novel way of growing wild flowers in the home window but made fine growth for the following year. The blossoms were all different, the large one white with cerise center, one pure white, and the other a lovely pink with a deeper center.

Freesias—sweet, dainty surprises that they are! We always marvel when the buds come out from among the grass-like foliage, then swell and burst into the exquisite yellow, bell-shaped flowers. From our six bulbs we had thirty-four branches of bloom, giving us six weeks of delight in their spicy odour.

The whiteness of the Poeticus Ornatus is equalled only by the dogwood of spring, and Nature certainly used her finest paint-brush when she painted the delicate crimson line on the edge of the cup.

We were a little doubtful about the *Narcissus gloriosus*, as we had never seen it, but we are friends for life now, for nothing could be lovelier than the long stalk surmounted by fourteen little blossoms with their deep orange cup and cream-white perianth. We asked our little daughter to smell them, and she immediately said, "Apple sauce." Could anything describe their fragrance better?

Then the Horsfieldii, with its long, yellow trumpet and creamy perianth —a flower truly fit for the gods! The perianth measures three and one-half inches in diameter, and the trumpet one and one-half inches long.

Abutilon blooms nearly all the time, and heliotrope, when it once starts, is not far behind.

As the plants came into bud we gave them fertiliser in liquid form once every week or two, and twice during the winter worked a little of the dry food into the earth, being careful not to get it too near the roots.

A Kenilworth ivy and two kinds of asparagus —*A. Sprengeri* in a hanging basket and *A. plumosus* on a bracket—completed our garden. That is all, except that we feel we have summer always with us.

CHAPTER XII. COLDFRAMES FOR WINTERING PLANTS

I. Coldframes for the Country Home

By J. N. Gerard

ABOUT coldframes I have always had varying opinions, sometimes considering seriously the arrangement of all borders so that they could be covered, and then again loathing the sight of sash. It is not so much that extraneous things in the garden offend one's esthetic sense (for a gardener, curiously enough, becomes oblivious to labels, stakes, and some other non-ornamental things), but frames require constant attention, and in winter we have too much wet and slush for comfortable work out-of-doors. Of course, thousands of amateurs have frames of violets and pansies, usually near the house, from which they gather pleasure as well as flowers—if they have good luck. That is easy enough; but speaking in a broader way of the full use of frames in a garden, the problem becomes more difficult.

Any one who amuses himself with a general collection of plants will find that frames or some sort of covering or protection are of use at all seasons. Snowdrops and certain irises will begin to flower at the first thaw and while the snow is on, and should have overhead covering. Later, some of the small alpines are quick to welcome the rising sun, and if they can be protected for awhile they not only pass unscathed by the warm winds of the season, but the open sash helps somewhat to keep them in a damp atmosphere. Mountain plants do not usually suffer from cold, but from the sun's scorching rays in a clear sky. On the Alps, as in the tropics, the rays are tempered by abundant vaporous moisture. If one has only a few plants, oftentimes a single sheet of glass, supported overhead on wires, answers for plants which cannot withstand excessive moisture.

As the season advances, "summer-ripe" bulbs and plants have stored up their food for another season, and are ready to rest for a shorter or longer period. For these, frames are again the ready way to keep away wet or moisture so that they will not be stimulated unduly. As the growing season ends, the frames come more into play, for we not only have to provide for blooming plants and forcing bulbs, but perhaps there are a lot of new things which look hardy, but which one would rather not trust outside until one has a larger stock. Then there will be slips and pots of seeds, and surely the flotsam and jetsam which is attracted to the amateur.

In short, there is no question of the usefulness and consequent pleasure of frames, even in a garden of hardy things. No one knows better than the grower of hardy plants that hardiness is a comparative term, and that plants as well as humans are subject to "consumption and sudden death," so that success is the result of vigilance, constant care, and propagation. Consequently, if we wish to have the nice things and not let our garden run to magenta-coloured phlox, we must protect, when necessary, those things which are injured by thawing, or are in some years uncertain. It is not the freezing which injures most hardy plants, for their cells are adjusted to expansion, but quick thawing will rack many of them seriously when at all advanced in growth; most things making such growth being in a state of nature protected by long-lying snow.

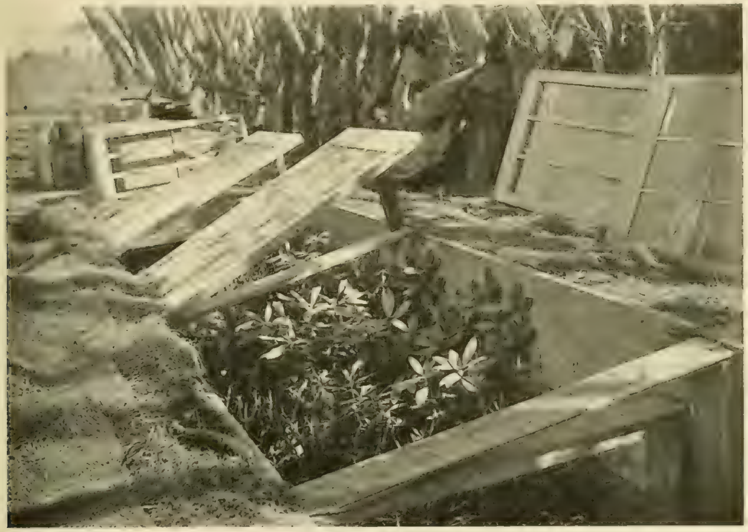
To recur again to the seamy side of the subject. Some years ago, being tired of airing frames in stormy weather, as a diversion, I raised the sash of my frames which were alongside of my greenhouse to meet the inclination of its roof, and by digging a path at the back had head room, with access through the furnace section. After that the operator worked in comfort and took his pleasure less sadly, especially after I had knocked out a part of the side of the greenhouse, and grew orchids with the right hand and rested hardy plants under the left.

II. An Amateur's Experience

By James Wood

Coldframes are not sufficiently appreciated by the general horticultural public. Under proper management so much can be done with them to lengthen the outdoor season of flowers and vegetables, in both spring and fall, and so many things can be safely carried through the winter with them, that it seems a pity they are not more generally used. Even where greenhouses are run, coldframes are of great service in aiding their work.

Coldframes may be very cheaply constructed where parties are willing to renew them every few years, or they may be substantially built where long-continued use is required. In the former case, cheap "box boards" may be used for the sides and ends, with spruce two by two-and-a-half-inch strips for the cross-pieces to support the abutting edges of the sash. For substantial structures it is well to build the front, back, and ends of brick, twelve inches in thickness, with a four-inch air space in the center, with sufficient cross-tie bricks to make the wall strong and secure. These walls should be covered with planks securely fastened by bolts built into the wall. To these planks the cross-pieces or rafters are fastened. Two by three locust pieces are best for these. The back should be twelve inches higher than the front for the ordinary six-foot width, to give good rain-drainage and an advantageous exposure to the sun. The planks on front and back walls should have the same inclination, so that the sash may be easily slid upon them.



Cheap but effective pits for wintering tender shrubs. They are protected by a windbreak of willows. The straw and matting are used in very cold weather

The ordinary commercial sash is three feet wide and six long. The glass may be six by eight, where the sash is liable to rough usage, or ten by fourteen where it is carefully handled and well protected. There will be three rows of the larger glass and five of the smaller. The larger glass gives rather the better results.

The writer knows of no better way to give an idea how coldframes may be used than to state just what the row with which he is most familiar contains in early winter. This row is one hundred and twenty feet long and is covered with forty sashes. It fronts southeast, and is well protected from cold winds. This position is better than any other, as the morning sun is more potent than the afternoon.

At the west end of the frames there are four sashes of violets—two of Marie Louise, and two of a very large and double Russian variety. These were rooted offsets planted in June last. The plants made a good growth during the summer and autumn, and are now full of buds which will give splendid bloom in the early spring. Next are four sashes of pansies. The plants were set in October, and will give a grand bloom in February if the weather is favourable, or in March and April if the season is backward. There are three sashes of English daisies, grown in the open ground from offsets of the choicest selected plants grown the previous season from seed. These were planted in the frames in September and are now full of bloom. The bloom will continue until next June. This daisy is more valuable than is generally known. Next are three sashes of polyanthus. These will give a wealth of bloom throughout the spring. This plant is generally hardy in the latitude of New York City, but it is desirable to have the flowers before the outdoor bloom.

Then follow six sashes of lettuce of the variety known as mignonette. Three of these were planted in September, so as to be advanced to heading when winter set in. These will be in prime condition for use in February and March. The rest were planted six weeks later, so as to be strong plants through the winter, to head up in April and May. The most solid, hard-heading sorts, that must develop very slowly, attain a higher quality in coldframes than when grown in any other way.

Next are two sashes of tea-roses, stored for planting out-of-doors for summer bloom. Tender and half-hardy roses can be carried through the winter in coldframes in the best condition for summer bloom. They can be packed closely, with a sprinkle of dry leaves among the tops.

Then follow ten sashes of cauliflowers, five in a row, with rows twenty inches apart. These were put in about October 1st, and will head in April and May. Between these rows are two rows to each space of savoury-leaved spinach. This was transplanted closely in rows in time to be at the best development in November. It keeps in perfect condition for use all through the winter, and attains a quality never found in outdoor spinach. When it is removed, the ground is entirely occupied by the cauliflower.

The last space of five sashes is occupied with sweet peas in rows two feet apart. The seed was put in early in October, so that the plants were five or six inches high at the beginning of winter. They remain dormant until spring, when they grow slowly. Here and in the cauliflower and rose spaces the soil is two feet below the glass. As the vines grow, short brush is used to support them until the glass is reached, when the sashes are removed. The plants will stand light freezing without injury. The rows are then carefully set with tall brush, and the finest of fine blooms come about the middle of May. The flowering will continue until the earliest outdoor blooms are ready. At no other season are the sweet peas so much appreciated.

As space is made vacant by the removal of lettuce, seeds of lettuce, beets, cauliflower, cabbage, cucumbers, and muskmelons in pots, and other things, are put in for the plants to be set outside for early use. Flowering annuals may also be started.

With greenhouses devoted to flowers and vegetables, the writer has found that these coldframes "pay" better than any other space under glass. Coldframes may be on any scale desired, from the three or four sashes of the beginner to the market gardener's hundreds. The writer once asked a market gardener who grew lettuce very extensively how he could afford to pay such heavy rental. He replied: "You see those frames. Every eight inches square of their space has six five-cent nickels in a little pile in the ground. I rake them out each season. You can figure it for yourself."

The labour in caring for coldframes is but slight, but the requisite attention they *must* have. This consists almost entirely of two things—water and ventilation. They must have air on pleasant or sunny days, and they must have water when that is necessary. Too frequent watering is very injurious.

For extremely cold weather protection is advisable. Covers made of tongued-and-grooved pine boards, one for each sash, are the most convenient and durable. Mats made of straw are warmer, but these get soaked with rain and then freeze into unmanageable nuisances. Straw mats with board covers are the best of all devices.

A sandy loam, with plenty of well-rotted manure, is the best soil for frames.

III. Advice of a Market Gardener

By Patrick O'Mara

A necessary adjunct to the flower and vegetable garden is a coldframe. In it the early plantings of cabbage, cauliflower and lettuce (raised from seed sown in the fall) are kept over during the winter. Hardy annuals and biennials, such as pansies, daisies, violets, chrysanthemums, auriculas, cowslips, forget-me-nots, hollyhocks, carnations, etc., are best grown from seed sown in August or early September, transplanted into a coldframe, and again transplanted in spring to a permanent situation.

A coldframe is easy of construction, being simply a box of the desired length on the surface of the ground, and covered with sashes when cold weather sets in. If possible, the frames should be constructed so as to run northeast to southwest, or east to west if the former is not feasible. Calling the side facing northwest or north the back of the frame, the board forming the back should be ten or twelve inches high—the width of a hemlock board; the front boards should be six or eight inches high. This will give a slope toward the sun, the better to catch its rays, and will also quickly shed rain. The frame is made by putting posts in the ground and nailing the boards to them, one at the center of each board and one at each end. The posts are generally made from hemlock joists two inches by three inches, and should be sunk about two feet in the ground, first giving them a good coat of tar. Where the boards join, each can be nailed to one post, the wide surface of the posts being faced to the boards, the posts to be on the outside of the frames. The standard length of the sashes is six feet, so that the boards should be five feet eight inches apart, thus allowing the sashes to project two inches over the boards, an inch at each end, for convenience in giving ventilation and in taking them off and putting them on.

Various devices are used to so fasten the sashes as to prevent them from being blown away by heavy winds. The simplest is to prepare small wooden wedges about six inches long, which are driven in between the sashes and so bind the whole frame securely. A safe way is to put a screw-eye in the end of each sash and a hook in the board and fasten each sash in that manner. These fastenings should be used on the north side of the frame, if the prevailing winter winds come from that quarter. Another method is to stretch a stout wire the length of the frame over the sashes and along the center, anchor it securely at each end to stout posts, fasten it at one end to a half-inch iron rod which is threaded and which passes through the post, an iron plate being on the outside of the post. Then, with a key screwed on the bolt, the wire can be made as taut as desired. Shelter from the cold northwest winter winds is very important. The market gardeners put up a six-foot fence behind their frames as a windbreak. The south side of a house, barn, or row of evergreen trees can be taken advantage of on small places. It will be necessary, too, to put a bank of barnyard manure against the outside of the frames, both sides and ends, as additional protection from cold.

Azalea shed and pits

The soil in coldframes should be well manured and well dug to get the best results. It is intensive culture, and the soil must be rich and mellow. Care should be taken, too, to see that it is well drained, and the frames guarded against any outside surface flow of water. Nothing is more harmful than a surplus of water in coldframes during the cold winter and early spring.

When the crop is out of the frames in the spring or early summer, it will be found beneficial to plant a crop of potatoes in them occasionally, also to seed them down to a green crop, such as red clover or millet. These can be dug in later in the season, and will be valuable to renovate the soil.

The uses for coldframes are many, and are indicated in the short list of plants given to be grown in them. Before violet culture reached the high state in which it is now, violets were very largely grown in coldframes for the New York market. One florist in Jersey City, who had an exceptionally favourable location, a sharp southern slope protected from the north, made a very comfortable living from about five hundred sashes entirely devoted to violets. Greenhouse culture of violets has, however, practically forced the abandonment of coldframes by florists. They can be and are still used by amateurs for their own use, and possibly to market the flowers if a surplus is produced. If violets are to be grown in coldframes, they must not be allowed to freeze hard at any time. Care must be exercised, therefore, to cover the frames during cold weather at night with straw mats or the new burlap mats, and over them close board shutters made out of half-inch pine boards, and the size of the sash. Heavy weights should be put on these to keep them from blowing away. These coverings will be found useful, but not indispensable, for plants in coldframes which are simply being carried over the winter. If care is taken to properly temper the plants in the early part of the winter, no covering but the sashes will be necessary. When snow covers the glass it should be removed as soon as possible, provided the ground in the frames is not frozen hard and the plants are consequently growing. If it is frozen hard, the snow may be allowed to remain on for weeks.

The most important point in handling coldframes is ventilation. With a frame tightly closed and the sun shining, the temperature in the frame, even in the coldest weather, will rise rapidly, and air must be admitted. The usual way is to have small blocks of wood prepared and laid on the sashes ready for use. With the wind blowing briskly from the north and the thermometer showing twenty degrees or less, give ventilation on the southern side of the frame. The blocks should be about four inches high, sawed out of furring strips. By inserting these flat, on edge, or upright, three gradations of ventilation can be given, as desired. Sometimes it will be found desirable to ventilate by tilting the entire sash and inserting the block either flat or edgewise at the middle of the sash, the block resting on the adjoining sash. With a strong wind blowing along the frame, this method is desirable, as the sashes can be tilted so that the angle of elevation is in the same direction that the wind is blowing. During fine days in winter, when the sun is shining and there is not more than two or three degrees of frost, alternate sashes may be removed. When this is done several days in succession, be sure that the sashes thus removed and placed on top of the next ones are alternated, so as not to have the same plants covered each day with the double sash. During the fine days of late winter and early spring the sashes should be removed entirely, piling them at the end of the frame.

Should the soil become dry at any time, so as to impede growth, then water, but this is not likely to happen during the winter months, and rarely even in the spring.

Many of these details may seem superfluous, but it is only by close attention to details that success can be achieved.

IV. Inexpensive Pits for the South

By Laura Jones

We who live in the southern or south central States can keep our pets through the winter months with much less trouble and expense than our northern neighbours. Pits are inexpensive, and in this latitude most plants can be kept in them without any artificial heat. In my own I gather tea-rose buds, sweet violets, primroses, geraniums, callas, carnations, abutilons, heliotropes, and a variety of greenhouse flowers at all months of the winter, and here I start greenhouse seeds and all of my summer-flowering bulbs.

One of the most important requirements of a pit is perfect drainage. An imperfectly drained pit will give the florist much more trouble than pleasure, for during heavy rains the water will often rise, causing too much moisture for many a choice plant. If drainage pipe is used, it should be placed in one corner, and the floor should slope from all sides to the pipe, so there will be no small pools of water in any part of the pit. In my own, the drainage pipe extends for about six feet from the pit, and is covered to about four feet with earth and sod. During severely cold weather, when the air cannot be permitted to enter at any other point, this serves as a ventilator, for the air is thoroughly warmed by the time it reaches the pit. One end of the pipe should be covered with finely woven wire netting or small iron grate, to prevent the entrance of rats or rabbits.

One wishes a pit to be a permanent structure, and rock and brick are therefore much used for the walls, but such walls are not altogether satisfactory. I have mine walled with planks of three-inch thickness, and, with the exception of one top plank, the lining is as good as when put in, a dozen years ago.

For the benefit of those who intend to have a pit, I will give dimensions, so that some idea of cost can be formed. Length, twelve feet; breadth, eight feet; height of north end, seven feet; of south end, four and one-half feet. This gives a slope of two and a half feet, which is sufficient to shed water, and permits the sun's rays to penetrate without obstruction. Twenty-five planks were used for the walls, and nine for the benches. Back under the other benches, about two feet from the floor, I had two long benches placed for storing away the boxes of summer-flowering bulbs and dormant plants.

The lumber used consisted of oak planks about fifteen inches wide and three thick, with four strips eight by two inches for outside finish. A pit of this size will hold a goodly number of pots, but, as it is necessary to economise space in the early spring, I have small shelves placed in the east and west corners, about one foot and a half from the top, for bulb- and seed-boxes.

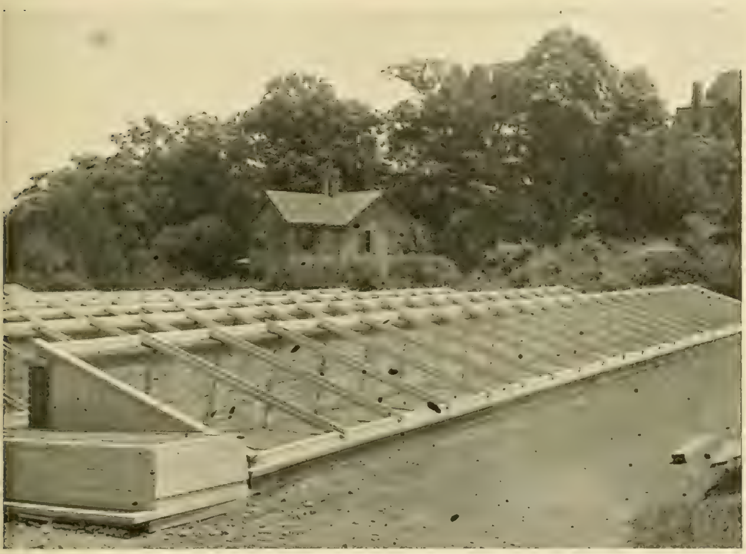
The cost of a pit is small. The digging, carpenter's work, and banking and lumber would have to be counted as the main expense. The cost of sash would be trivial, but cheap glass is quite expensive in the end. In placing benches, put them low enough to prevent the plants from touching glass, as the hot sunshine will scorch foliage. In banking earth around the pit, it must be securely packed against the plank, so there will be no airholes for frost to enter.

V. VIOLETS IN COLDFRAMES

BY SARAH HOPKINS

ONE is often told that it is not practical to raise violets in New England in coldframes, but from experience I can affirm the contrary. I bought six ready-made coldframes, and they are so well made and of such excellent material that they can withstand the coldest of weather. It is best to be on the safe side, however, and in severe weather straw matting should be placed on the glass, and then boards. The mats can be made at home with burlap and of straw made into mattresses, or they may be bought for one dollar and a half apiece.

My violets are a source of great pleasure to me. They are a delightful family, and on cold days, when all the ground around is frozen, they alone are warm and fragrant. As I spent two winters in trying to get my frames "mounted," so to speak, it may be of some help to others to hear of my trials. First, ground-moles attacked them and plowed and replowed the roots until the violets were almost dead. Had I but known it, "rough on rats" kills them. I always sunk the frames, which proved a poor plan in my case.



Coldframes of brick and iron

Select a high and dry place near a fence or hedge of evergreen trees for shelter from the north. It may even pay to build a fence along the north side. The frames must have as much sun as possible. The soil should be banked up around the frames to keep out cold and dampness.

In my six frames are planted one hundred and eight Lady Hume Campbell violets. Every two weeks or so I pick at least two hundred blossoms, and they are of an unexcelled fragrance and colour. Next year I intend to double the number, as I believe my coldframes produce finer flowers than any I have seen grown in a greenhouse.

There are very few days when it is too cold to pick violets in the middle of the day. Take a small covered basket, lined with something; open the frames a little at a time, and drop the blossoms into the basket. Of course, there are some days when the matting cannot be taken off, but there are not many of them. Each day the frames must be aired, if for only ten minutes at a time. It is best to have a small thermometer inside; and seventy-five degrees is the highest temperature that should be allowed.

VI. PANSIES, FORGET-ME-NOTS, AND WALLFLOWERS

BY THOMAS MURRAY

FROM a coldframe may be had violets, wallflowers, forget-me-nots and pansies in March, "hepaticas" and trailing arbutus in April, together with wood-violets, wood-anemones, and the many other wild flowers, thus starting the flower season two months ahead. Again in October and November, when everything outside has been nipped by early frosts, the coldframe preserves a few choice heliotropes, begonias, Marguerite carnations, nasturtiums grown in pots, scarlet sages; and the queen of the autumn, the chrysanthemum, is seen in all her glory.

Violets for growing in coldframes are propagated, like strawberries, by runners. Great numbers of these are formed in April just as the flowering season closes. Take as many as you need to fill the frames the following year—say thirty-five to forty-five for a six- by three-foot sash, remove the old plants, and put the young ones in their places. Or, should the space be required for other things, place the young plants three inches apart in shallow boxes or in small pots until the beginning of May, when they should be planted in the open ground, kept watered and cultivated in summer, and transplanted into the frame, seven inches apart, by the middle of August. Flowers may be picked from early October until late November. In sections where the thermometer registers zero it will be necessary to keep the frames comfortably covered. In warm sections flowers may be picked all winter.

When plants are frozen, they should be left so, but during long warm spells air must be given or they will "damp off," or rot. The sunshine in

February will bring the flowers out again, and they will continue to bloom until April. In summer all plants should be frequently sprayed to keep them free from the red spider and green fly, otherwise they will give trouble in winter.

The best single blue varieties are California and Princess of Wales; the latter has the larger flower and longer stem. Among double blues, Marie Louise and Farquhar dark are favourites, but Lady Hume Campbell or light Farquhar is the best. This variety has a more rugged constitution, and blooms later.

Forget-me-nots are raised to perfection in coldframes. Sow the seed in July in a sheltered spot in the open ground. In four weeks, or when plants are large enough to handle, transplant three inches apart; water and grow along till late in September, then plant seven inches apart in frames, and keep them growing till frosts set in. A covering of three inches of dry leaves or straw should then be put over them. The frost will not hurt them, but the sun shining on them when frozen burns the leaves. When the weather gets warm in spring, remove the leaf mulch. The plants bloom during April and May.

With the same general treatment, but leaving them in the open, the plants start to flower toward the end of May, and bloom continuously till July. The seed then falls, in due time germinates, and flowers appear next season. Old plants will bloom several years, but young plants each season give best results.

Wallflowers in coldframes are very satisfactory. Sow the seed in April or May in the open ground or in "flats." When the seedlings are large enough to handle, transplant three inches apart. They will crowd each other in four weeks, when they may again be transplanted, giving each plant a square foot. By the first of October they will be twelve inches high, and bushy, and may be planted singly into six- or seven-inch pots, or several in boxes, and removed to the frame, where they should be covered to prevent alternate freezing and thawing. They do not like high temperature, so the sash should be removed on all clear days, especially in February and March, as they start growing then. They flower in April. We have heard that around New Rochelle, N. Y., some plants have been known to flower after being left outside all winter, but we have never seen them.

Mignonette is always welcome and a general favourite in the garden and yard, but it is seldom seen in the window garden or coldframes, although it can be seen at its best when grown in either position during the fall and winter.

Sow the seed of the "Machet" or "Allen's Defiance" strains about August 15th, in small pots, putting four or five seeds in each. Water, and cover them with a sheet of newspaper. If the paper is kept moist the soil will not require watering again before the little plants come up. If more than two seedlings grow in each pot, they should be pulled out. For pot culture, as the pot is filled with roots more room should be given, until each has been potted into a six-inch pot. The stalks should be supported. After the center stalk flowers and is cut away, many side shoots will push out, and each will have a spike of flowers. Mignonettes may be kept in bloom all winter. When plants are to be grown in frames, they may be planted there as soon as the small pots first fill with roots. By planting several in a large pot a large specimen can be grown which attains a height of two feet and a diameter of the same.

Pansies are raised from seed sown each season. It is not necessary that they should be bought each year, as home-saved seed is equal to any from the store, always providing a good strain has been secured at the start, as Henderson's Mammoth Butterfly, Giant Trimardeau, or German mixed. They do best in frames, or "flats." They take kindly to transplanting, and can be moved when in full bloom. A good watering always brightens them up after moving. For early spring use in the window box, or for cut flowers in the coldframe, or for planting in beds, sow the seed the middle of August. When large enough to handle, about the time the third leaf shows, transplant singly three inches apart in shallow boxes. Attend to watering until they freeze, then cover with dry leaves and leave till spring starts them into growth again. They will stand a sharp frost. Ten degrees will not materially affect them, so they may be planted out in beds or window boxes the first week in April. For summer and fall flowering, sow seed in April, grow along, and plant in a shady bed eight inches apart.

CHAPTER XIII. HOTBEDS FOR EARLY FLOWERS

I. How to Manage Hotbeds

By Patrick O'Mara

HOTBEDS are most excellent things for those who appreciate early vegetables. They are also useful for flowers, especially tender annuals, and enable the horticulturist, whether amateur or commercial, to hasten the growth of asters, pansies, and the like. In fact, a hotbed is a cheap and often the only available substitute for a greenhouse.

The size of a hotbed is determined by the requirements of the place; a convenient size is nine feet long, taking three sashes. An excavation three feet deep will be necessary. This should be boarded up completely from the bottom, the back rising two feet above the surface, the front eighteen inches. Cross-pieces four inches broad and an inch thick are let into the boards a sufficient depth to allow the edge of the boards to be even with the under surface of the sash when it is put on. A strip an inch wide and as thick as the sash, nailed along this, provides a tight frame for each sash, and renders ventilating easy.

Fresh horse manure is the material used to furnish the heat. A quantity sufficient for the purpose should be procured at one time. Small quantities procured at intervals will not suffice. After a few days the pile will begin to ferment, which fact is made evident by escaping steam. The pile should then be thoroughly forked over and formed into a new pile. In two or three days fermentation will again occur, and then the material should be put in the hotbed, treading it down evenly and firmly to a uniform depth of two and a half feet. It is better to mix decayed leaves in equal quantities with the manure, but this is not essential. If the leaves are used the work is hastened somewhat, as fermentation is not so active. The bed being made, put the sashes on the frame. When a thermometer, plunged into the manure, shows 90 degrees F., put in soil to the depth of five or six inches and firm it down. This should be a rich, well-prepared compost, one-third well-rotted barnyard manure and two-thirds fibrous loam.

Great care should be taken in watering. If too wet, the plants "damp off," or get weak and spindling; if too dry, they are likely to be lost altogether. Ventilation is a most important point; an hour's neglect may destroy the crop of seedlings. When the sun is shining, the temperature may be allowed to rise to 70 or 80 degrees; at other times, from 55 to 60 degrees is a proper temperature.

A market gardener's lay-out of glass (Near New York City)

Covering with mats and shutters is highly essential. If a cold night is coming, close up the frame early to store the heat, and put the covering on about an hour before sunset. Take it off in the morning from an hour to two hours after sunrise during cold weather. The sides and ends aboveground should be banked up with earth and six inches of manure to keep out cold in severe weather.

Of course, the young seedlings must be transplanted in the hotbed, and the cultivator must provide room enough for that purpose. A sash will cover fifty lettuce plants transplanted for forcing; it will cover 500 transplanted from the seed-bed. The latter number may be taken as a fair average for the general run of plants which a sash will cover after transplanting is accomplished. As sown in the seed-bed, before thinning or transplanting, a sash will cover about 5,000 seedlings. A sash will cover 500 radishes thinned out to grow to maturity.

In transplanting, be careful to do the work quickly and thoroughly, firming the plant well with the planting-stick. Do not allow the plants to be out of the ground a minute longer than is necessary. Water them well after transplanting, and shade them with dampened sheets of paper for a few days until they have taken root. Tepid water, say 90 degrees F., can be used with benefit in watering plants in hotbeds, for the reason that the heat in the bed must be conserved. When the season's work is done, take out the manure and soil, which now has little value except, perhaps, to lighten heavier soils used for potting.

II. How to Make a Hotbed

By W. C. Egan

Choose a sunny position protected from the prevailing spring winds by a fence, building, or hedge, where the surface drainage will be away from the site of the hotbed. Have the lower side face south, if possible.

For a permanent frame, excavate from two to two and a half feet deep, and tile-drain the bottom. For sides use a brick or cement wall, one or more feet thick, or plank from two to three inches thick. A hollow wall in either case will retain the heat longer; and if it is floored with wood, so much the better.

View in a greenhouse. Persons who raise quantities of melons often plant all their seeds in splint forms or baskets made for the purpose, but the same kind of boxes may be used in a hotbed

Remember that a single sash is three feet wide and three long, slanting lengthwise, so that the inside measurements must be multiples of these figures, first allowing a three-inch lap at all the four sides on which the sash will rest. The portion aboveground should be one foot in front and eighteen inches at the back, with the sides tapering.

If cement or brick is used, a box frame of two-inch plank should be bolted on (bolts set in the cement), and strong cross-bars run across where the sash meet. An inch strip may be nailed on these bars to divide the sash. If this is done, the width the strips occupy should be figured in the measurements. Cypress is the most lasting wood to use.

Mats made of burlaps, straw, or fiber, obtainable at the stores, are advisable to use during cold nights. Light wooden shutters further retain the heat and keep the mats dry during stormy weather. Banking up against the frame with coal-ashes or loam is commendable.

Temporary hotbeds are made by first preparing the manure as described elsewhere and spreading it out on the ground two or more feet deep and fully two feet wider all around than the frame to be used. On this set a frame one foot high in front and eighteen inches at the back and bank manure around it. Or have another frame one foot wider all around, which place outside, and fill the space between with manure.

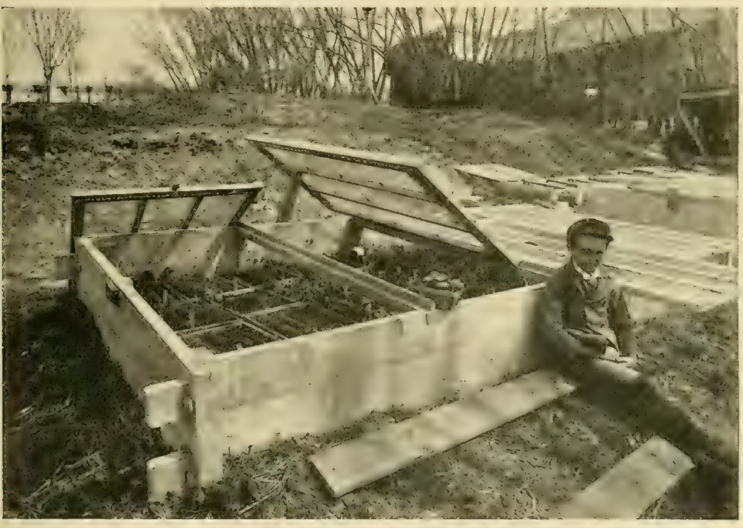
The preparation of manure for a hotbed is a matter of great practical importance. The result aimed at is a slow, moist, enduring heat. This condition is secured only by the proper manipulation of the manure before it is placed in the frame. Often fresh manure that comes from a boxed structure is quite hot when received, and it is sometimes used at once, but the result is a quick, violent heat, rankly charged with ammonia, that soon burns itself out, and ceases to act while the weather is still cold.

Fresh horse manure is the best possible kind to use, and should have a good deal of rough, stable-soaked straw or litter in it. If this is lacking, litter or forest leaves may be added.

When it is received, shake it up most thoroughly, if it is naturally moist, and place it in a pile to heat. Protecting from rain or snow by covering with boards or piling under cover is beneficial, but not necessary. If the manure is dry and not inclined to heat, moisten it with hot water, which will soon start it.

Let it stand three or four days, then turn again, placing what was outside in the interior, thoroughly shaking each forkful, and pile up again. Let it remain a few days until thoroughly heated through, when it is ready to be placed in the frame.

Here it should be distributed evenly, and eventually be packed down firmly, especially at the sides and corners. If the gardener is not rushed for time, it is well to let the manure lie loose for a few days, during which time it will heat again. Put on the sash, but ventilate day and night until the steam passes off. During this process most of the ammonia escapes, which is desirable for this purpose, as the manure is useful for its heat alone, and not for plant food. When a thermometer, sunk in the manure and allowed to remain a few minutes, shows a temperature of less than 100 degrees, the bed is ready for use. I like to use two cubic yards of fresh manure to each sash of three by six.


If one is to have a hotbed every year, it is usually better to use heavier lumber, and to mortise the corners together

Seeds may be sown directly in the soil covering the manure, in which case the soil should be about six inches deep; or, if sown in shallow boxes, which are placed directly on the soil, the earth covering may be only three inches deep.

When the young plants are up, shade a little with open lath frames, or strew litter lightly over the glass on hot, sunny days, and ventilate by raising the leeward side of the sash.

During the early summer, after the plants have been removed, lettuce or radishes may be grown in the hotbed. Where six inches of soil has been used, cannas will grow to perfection; they seem to delight in the half-spent manure, either in the beds or when removed to their outside plantings in June.

When fall comes, remove the soil and manure and you have an admirable pit in which to bloom chrysanthemums; or partially fill it with sifted coal-ashes and in this bury the pots containing bulbous plants, such as Easter lilies, tulips, hyacinths, etc., which require darkness and freedom from frost in order that they may develop their roots before throwing up their tops. These may be brought into heat as required, and forced.

It is well to cover the frame with sash and shutters during the winter in order to keep the frost from the interior.

CHAPTER XIV. THE PLEASURES OF A SMALL GREENHOUSE

I. The Greenhouse in the Snow

By L. H. Bailey

IT IS in the dead of winter that the greenhouse is at its best, for then is the contrast of life and death the greatest. Just beyond the living tender leaf—separated only by the slender film of the pane—is the whiteness and silence of the midwinter. You stand under the arching roof and look away into the bare, blue depths where only stars hang their cold, faint lights. The bald outlines of an overhanging tree are projected against the sky with the sharpness of the figures of cut glass. Branches creak and snap as they move stiffly in the wind. White drifts show against the panes. Icicles glisten from the gutters. Bits of ice are hurled from trees and cornice, and they crinkle and tinkle over the frozen snow. In the short, sharp days the fences protrude from a waste of drift and riffle, and the dead fretwork of weed-stems suggests a long-lost summer. There, a finger's-breadth away, the temperature is far below zero; here is the warmth and snugness of a nook of summer.

This is the transcendent merit of a greenhouse—the sense of mastery over the forces of nature. It is an oasis in one's life as well as in the winter. You have dominion.

But this dominion does not stop with the mere satisfaction of a consciousness of power. These tender things, with all their living processes in root, and stem, and leaf, are dependent wholly on you for their very existence. One minute of carelessness or neglect and all their loveliness collapses in the blackness of death. How often have we seen the farmer pay a visit to the stable at bedtime to see that the animals are snug and warm for the night, stroking each confiding face as it raised at his approach! And how often have we seen the same affectionate care of the gardener, who stroked his plants and tenderly turned and shifted the pots, when the night wind hurled the frost against the panes! It is worth the while to have a place for the affection of things that are not human.

Did my reader ever care for a greenhouse in a northern winter? Has he smelled the warm, moist earth when the windows are covered with frost? Has he watched the tiny sprout grow and unfold into leaf and flower? Has he thrust a fragment of the luxuriance of August into the very teeth of winter? Then he knows the joy of a conquest that makes a man stronger and tenderer.

Here is the warmth and snugness of a nook of summer

Greenhouses are of many kinds. There is one kind of the commercial plantsman, and another of the man of means whose conservatory is essential to the architectural completeness of his mansion. Of these we need not speak here, for their necessity is long ago established. But for another kind we wish to plead -for the quiet, unobtrusive greenhouse as an adjunct to a modest home.

The object of this simple winter garden need not be the mere growing of flowers, although these may be had without trouble. It is worth the while to grow a plant just because it is a plant and because we are human beings.

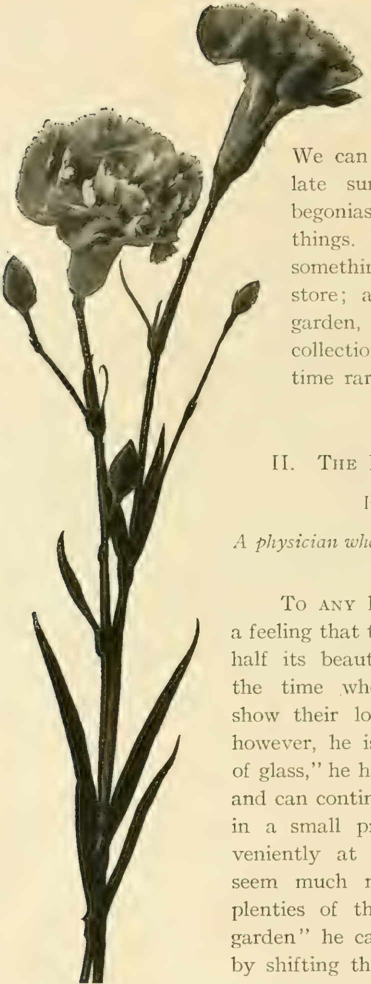
The fences protrude from a waste of drift and riffle, and the dead fretwork of weed-stems suggests a long-lost summer

The best plant is the one that has the deepest significance to you, even though it never make a flower. I know a man who has hundreds of plants in expensive greenhouses, and the best plant of all is a little white clover that closes its leaves by night and opens them by day.

Against the background of winter every green and growing plant is emphatic. Against the luxuriant background of summer a plant twice as good may be overlooked and lost. The simplest and easiest things are best, for it is not well to make the uncommon things too common. A dainty rarity is all the better because it is seen in contrast with the homespun of the geranium and begonia; and the common things perpetuate the continuities and purposiveness of our lives.

A snug little greenhouse where green things grow and flowers bloom in the very teeth of a northern winter

Like all effort that is worth the while, the labour of growing plants under glass requires watchful care. This care is its own reward. Many plants, however, are easy to grow, and with these the novice should begin;



It is pleasant to grow one's own carnations

and with them, also, the very busy man should be content. All of us can grow bulbs. We can lift the roots of petunias and alyssum from the garden when the frost comes. We can start the seeds of many annuals in late summer. We can make cuttings of begonias and coleus and a score of common things. Here and there we can pick up something new. Gradually we add to our store; and in three years' time our winter garden, small or large, becomes a unique collection of old-time friends and of new-time rarities.

II. The Fun of Having a Greenhouse

By Arthur G. Minshall

A physician who takes time for a greenhouse gives some useful warnings

To any lover of the garden the frost brings a feeling that the world in which he lives has lost half its beauty for him, and he anxiously awaits the time when the leaves once more begin to show their loveliness of green in the spring. If, however, he is the lucky possessor of "a small bit of glass," he has discounted the effect of the shock, and can continue to worship his favourite goddess in a small private shrine which is always conveniently at hand, and whose selected treasures seem much nearer and dearer than the lavish plenties of the summer garden. In this "winter garden" he can have a constant change of scene by shifting the various parts, and by bringing in the sleeping roots and bulbs to brighten the field whenever variety may be desired; and if he

These tender things are wholly dependent on you for their very existence

has been properly far-sighted there will be a "continuous performance," however limited the stage may be, until the returning heat of the summer renews the necessity of his attention being directed outside again.

To descend to more personal and practical details, my experience is that the man who has to run his own little greenhouse, and who has any sort of outside garden, would better not try to keep both going at full steam at the same time, unless he has an abundance of leisure time at his disposal. Somehow, too, there is not the attraction about the indoor growing of plants when everything is flourishing in the less-confined and healthier surroundings of the garden bed. Give your time to the greenhouse in the winter half, and to the outdoor life for the remainder of the year.

However, when one's "glass" is part of the house, and would look very forlorn if empty, a fair showing can be made with a few begonias, amaryllis, and foliage plants which do not love the exposure of the open, and which with sufficient shading and sprinkling will not suffer from the heat, as so many other greenhouse pets do. Some people use fancy-leaved caladiums to make a summer display indoors at a small cost in time and trouble. The umbrella plant (*Cyperus alternifolius*) is much used for this purpose. If there is a blank wall to be covered, *Ficus pumila* will be found excellent. It looks well both summer and winter, and requires little care.

My own little oasis opens directly out of the dining-room, and is heated by steam from the common furnace. I have deduced a few simple axioms for its successful operation.

Don't let green fly, mealy-bug, or scale go too long; smoke or spray when at all plentiful.

Don't have the place too hot; give plenty of air on every possible occasion.

Don't try to grow rare novelties; stick to robust, standard things that will not require coddling.

Don't try to grow palms and pansies under the same conditions; one or the other, if not both, will prove a failure. The things that do best with me are those that every florist sells as "house plants," and which are "the survival of the fittest."

Lastly, retire to your greenhouse when you have an attack of "the blues"; it will be the better for every one concerned. There is nothing like a greenhouse to keep one cheerful.

III. Grow the Easy Things

By J. A. Ellis

Advice of a Canadian amateur who owns a fifteen-by-twenty greenhouse costing one hundred dollars

I have a small garden in which I grow many flowers and vegetables. Some years ago I decided to build a little greenhouse in which I could raise my own plants in the spring for the garden, and which would be a "thing of beauty and a joy forever" during the remainder of the year. Accordingly, I constructed a lean-to, about twenty feet by fifteen. It cost me about one hundred dollars.

Chrysanthemums on a side bench

At first I thought I would run it all the year round. Not having a furnace in my house, I heated it by means of hard wood burned in a large box-stove, and found this did very well so long as the fire was properly looked after. This, I knew, would entail my getting up in the middle of the night, when the weather was zero or thereabouts, to renew the fire, but I had no fear about my not doing this. However, I

Easter-time—the height of the greenhouse season

omitted to get up on two or three occasions, and, of course, those were the nights when the thermometer dropped out of sight. I found nearly all my plants frozen, and I came to the conclusion that this would not do. Now I keep the greenhouse going until very cold weather comes, when I remove the plants into the house, and in early spring I take them back again to the greenhouse.

When stocking the greenhouse I had visions of some of the fine plants which we see pictured in the catalogues, and I went in for a most miscellaneous assortment, including chrysanthemums, roses, carnations, orchids, palms, ferns, etc. I soon found, by bitter experience, that to grow all these plants successfully different temperatures were required. I succeeded in killing off a good deal of my first stock by trying one temperature after another. Finally I made up my mind that I would have to discard those plants which required a high temperature.

One year I grew nearly all chrysanthemums and did very well with them, but gave them up, as I found that they demanded more time and attention than a busy amateur could give.

I have now got down to the commoner plants, such as fuchsias, begonias, geraniums, abutilons, primulas, cyclamens, and a few palms. I find that these all thrive pretty well in the same temperature, and there is nearly always something in bloom. Such plants as these, too, are more easily placed to advantage around the house in winter.

On the whole, I would not like to give up my greenhouse. By its aid I am enabled to raise flower and vegetable plants for my garden in the spring. I keep it fairly attractive in the summer and fall, and in the winter I can beautify my house with the plants taken from it.

IV. A Suburban Experience

By J. N. Gerard

An amateur can readily dispense with most tools rather than with a greenhouse. If his taste for growing things is catholic, it becomes a necessity; and if he collects only so-called "hardy" plants, it is scarcely less a most valuable adjunct to his garden. With a winter of practically seven months, a man without shelter for plants misses more than half his pleasure in seeing things grow. I say "a man" advisedly; a woman, somehow, being able to grow plants to perfection in living-rooms under adverse circumstances. A greenhouse is nothing more than a tool to a gardener, and it is difficult to see why greenhouses should be placed so prominently in gardens, and often made so pretentious. They would mostly be improved by a coat of dark-green paint, which would help to eliminate them from the landscape; or, if near the house, they might be of some colour which would make them as inconspicuous as possible.

Having satisfied oneself as to the need of a house, the ways and means are in order. Here, as in most garden matters, the cost is on a sliding scale which bears no relation to the pleasure to be derived. One can spend several hundred dollars on a small house, or, if he is handy with tools, can, by using sash, cover as much space as one would care to look after at an expense for materials of fifty to seventy-five dollars. A good hot-water apparatus with two-inch pipes should cost as much more. This will cost nothing to place, if pipes are bought cut to right lengths.

There are makeshifts for heating, but for a small house or a large one there is nothing as satisfactory, to my mind, as hot-water circulation from a self-feeding heater. These heaters need no attention oftener than twice daily. One does not care to be tied up to a fad, and a greenhouse so heated can be left to the care of almost any one. I have heated a house fifteen by eighteen feet for about ten years with such a stove with an average of less than twenty-five pounds of coal per day.

In a greenhouse, as with other things, it is not what you put in, but what you get out of it, that counts. The "cropper" finds his fun in practical results, while another has just as much fun in letting things grow and seeing visions without tangible results; while another man, who should be an entomologist, persecutes bugs to his joy. (There are insects to be found in a greenhouse sometimes.)

There are some advantages and some disadvantages in attaching a greenhouse to a dwelling, but the man who likes his fling and wants a work-house had better have it at a little distance, where his ideas of order will not receive critical attention. In this case he will be doing about the best for his comfort if the house is only shortly distant from the dwelling, when the heater may be placed in the cellar, to the saving of room, and the saving of comfort on stormy nights.

Do not get hot yourself when told that "you should see Mr. Brown's flowers," when you know they are chickweed as compared with yours.

An ideal worth striving for—to own such a place and share it with others

The feathery grace of palms, the rugged strength of sword-like pandanus leaves, the greenery of ferns and hanging baskets, the rich form and colouring of certain begonias

V. A Rose-fancier's Hobby

By Edward A. Reed

Eight hundred roses per season in a house ten and one-half by fifteen and one-half feet

My little greenhouse is built directly from, and includes a part of, the piazza on the south side of the house. It is ten and one-half feet wide and fifteen and one-half feet long, including the piazza, which is five and one-half feet.

A door from the parlour opens upon the piazza, and then a few steps lead down to the floor of the greenhouse proper; on the west is a door into the garden. The entrance from the house I regard as of supreme importance, because, fully to enjoy a greenhouse, you must be able to run into it easily, at odd moments, when you are pressed for time or the weather is stormy; and then what pride and joy, on a bleak winter's day, to simply open the parlour door and show admiring guests the pots of hyacinths and daffodils —above all, roses!

The greenhouse is heated by a small hot-water stove, but I imagine that it might be done more easily and cheaply by a coil, if our furnace permitted it. Sloping shelves fill the piazza for palms, begonias, geraniums, callas, and other plants, especially such as require little sun; for, of course, there is no direct light overhead on the piazza part of the greenhouse.

The benches are filled entirely with roses—between sixty and seventy in all—Souvenir de Wooton and Bon Silene, with a few Safranos and Perles. As the winter comes on we lock the garden door and fill that end of the passage with roses in pots. Most florists would smile at the idea of raising roses in such a house as mine, but I average eight hundred blooms from October to June. This is a generous reward, not to mention the pleasure of the work.

The roses are taken out the last of May, and new ones planted in the benches, in fresh soil. During the winter the soil is fertilised with well-rotted cow manure and a little bone-dust. A short hose, from a faucet on the piazza, easily waters and syringes the plants. Roses must be thoroughly syringed to keep down red spider. A guard on the top of the piazza and a wire screen over part of the greenhouse protect the glass from the snow from the roof of the house.

In my opinion, no one should attempt to raise roses in such a house who is not thoroughly in love with them, but ordinary plants and flowers may be easily managed.

VI. A GENERAL COLLECTION OF PLANTS

BY HUGO ERICHSEN

A nine by twelve-foot house containing something besides the "easiest" things

FEW things have given me greater pleasure than my little greenhouse, though it is but nine by twelve feet in size—just large enough to accommodate a comfortable chair (in addition to the plants), in which, more than once during hours of illness, I have basked in the sunshine that filtered through the roof. Many and many a time it has conveyed to me a cheering message of promise, presaging the joys of spring.

A capacious bench in the form of a horseshoe accommodates three rows of plants of medium size. In order to prevent overcrowding, I have elevated plants with considerable foliage on iron stands. Heat is supplied by water-pipes connected with a coil in our hot-air furnace. One door gives access to the dining-room, and another opens into the garden, thus facilitating transplanting and other work.

In one corner, a square opening was left in the floor, enabling me to plant a Marechal Niel rose in the ground, of which that vigorous grower quickly took possession. For a long time its growth was hardly perceptible, but now it covers the top of the greenhouse, forming a verdant canopy from which large, fragrant yellow roses depend during the season.

I consider palms and dracænas very useful in conservatories of limited size. Among blooming plants, I like the Dutch bulbs, azaleas, some of the begonias, geraniums, *Olea fragrans*, the baby primrose (*P. Forbesii*), *Genista Canariensis*, the Japanese chrysanthemums, and some of the varieties of abutilon. These, with specimens of *Araucaria excelsa*, philodendron, aspidistra, and an Otaheite orange or two, will fill all available space.

I make it a rule to fumigate my "winter garden" every fall, to prevent an invasion of aphides. Smut, which gives me considerable trouble, is controlled by applications of sulphur.

If I could not do any better, I would convert a cellarway into a green-

A general collection of plants at the end of the chrysanthemum season

house by covering it with window-sashes, and heating it with an oil-stove In competent hands an outfit of this kind would do wonders.

VII. A Greenhouse Near Cincinnat.

By E. T. Harvey

My greenhouse is built on the east side of the house, and is connected with the dining-room by two doors, which were formerly windows. A window from the kitchen also looks into it. Altogether, it is thirty-four feet long, part of it twelve feet wide, and the extension with sloping glass roof is eight feet wide. As its appearance indicates, it has grown from time to time, and I think for that reason it seems to fit into the situation better.

Mr. E. T. Harvey's modest greenhouse at Bond Hill, Ohio

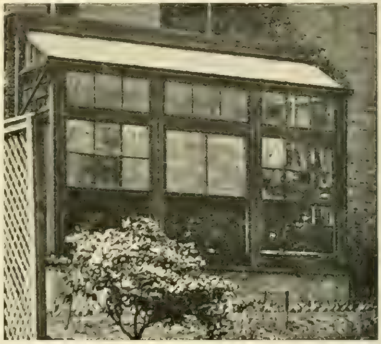
A flower bed about two and one-half feet wide, which runs all around the house and next to the walk, serves as an ideal place for Dutch bulbs, and it is made thoroughly impervious to moles. During the summer it is mostly filled with pot plants from the greenhouse. The flowering vines, as shown in the picture, are tall nasturtiums, which are still blooming until the middle of November.

At the south end of the greenhouse I have a large cold-pit. This I reserve for the tender roses and half-hardy plants. In addition to this, I have another pit for sweet violets, and I have a large lot entirely devoted to flowers, flowering shrubs, and trees, so there is considerable to look after.

My greenhouse is heated with a hot-water heater that also supplies the eight-room dwelling house. I have always used anthracite coal, as it makes a more reliable, steady heat. In cold weather I try to arrange to have the fire at its best about two or three in the morning, and it lasts from ten at night until six or seven next morning. I have curtains to let down at some of the windows in the greenhouse, and when the mercury gets into the zeros I favour the more tender plants as well as I can. Of course, in growing such a variety as I have the conditions are not suited to all, but I seldom lose any. The list is too numerous to mention, but I have some large palms, a fine specimen of *Pittosporum Tobira* more than five feet across, a loquat in bloom, orange and lemon trees in fruit, araucarias, azaleas, camellias, begonias, ferns, a lot of flowering plants, and even crotons.

In summer I move all the plants and arrange favourable and attractive places for them about the garden. Five or six night-blooming cereus, a few climbing roses and a large *Monstera deliciosa* are about all that remain inside, and they are too large to handle.

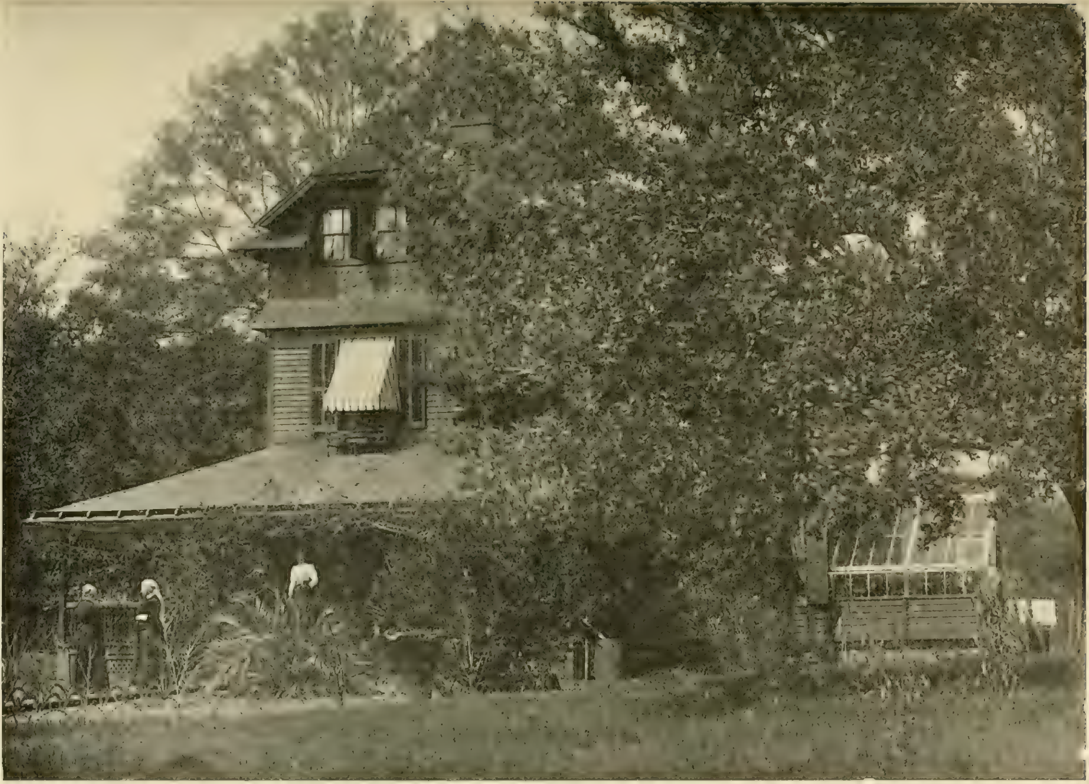
It is hard to estimate the cost, as I have made so many changes, but I should think about $350 would put up the building if I had to do it over again.



This greenhouse could be built for about two hundred dollars

I cannot imagine how any one who loves plants could spend money better than by building a small greenhouse. Things may be so arranged that fifteen or twenty minutes, or a half-hour at the most, every morning is plenty of time to care for it, but one will take a great deal more time than this when one has the opportunity to enjoy it.

After the dark days of winter, when the days lengthen and the sun grows brighter, comes the most enjoyable time in the greenhouse. The plants seem to freshen up, and I have tender water-lilies and other things to start in anticipation of summer time. Who but an enthusiast can appreciate the joys of the new spring catalogue? Besides the pleasure of the flowers comes the feeling of looking after and caring for the plants. He who grows roses "must first have them in his heart." Very few days in the year pass without some flowers from the greenhouse on our table, and then there is the pleasure of caring for the plants themselves. They all have different needs and associations, like old friends. I should not wish to live without a greenhouse. There is no end of satisfaction in growing good things and watching their development.



A winter home in Florida. Note how much the little greenhouse adds to the attractiveness of the place

VIII. The Cost of a Greenhouse

By Maida Maitland

A case where it paid to add a conservatory to a rented house

A little more than a year ago, as we stood gazing out on our first garden, the thought of the chilly winds and frosts of winter sweeping away the wealth of bloom and leaving things desolate filled us with feelings of keen regret.

"Why not build a small conservatory and carry on our gardening through the winter?" I temptingly suggested.

"I am afraid the cost is away beyond our means," was the cautious man's reply.

"We can at least get prices and consult our bank-book," the tempter ventured.

The man's eyes brightened as a vision of roses, carnations, and bright flowers blooming amid the snows of a Canadian winter rose to his mind

Landlord, plumbers and contractors were interviewed, and the proposition stood thus: The landlord agreed to *allow* us to build a conservatory, to become his property on our removal from his house. The house was to be ours for five years, and forever if we wanted it. A conservatory ten by sixteen, built of best material, would cost $150.

The woman sat back with disappointment plainly visible on her face, for this to her seemed too large an outlay to spend on a house not their own.

"Let us see, now," said the business man. "Spread over five years, $150 would increase our rent exactly $2.50 per month, and if we remained ten years it would be $1.25."

"Then if that is all, we'll have our greenhouse!" was the woman's joyous reply, "for by your figuring it just amounts to our cream bill for the month."

In three weeks the work was completed, and there was an air of excitement about the place as the plants began to arrive. A good space was set aside for carnations; these were benched, likewise the roses. Down the center we placed a rack with three shelves, decreasing in width as it ascended. The top shelf was built like a window-box, only wider, and around both sides our choicest vines were planted, but so arranged as not to interfere with the shelves beneath. Around the other two sides of the room a bench was placed with sides built up to hold three inches of earth. At the inside edge of this, moon vines, swansonia, and the beautiful passion vine were benched at intervals and trained on trellises to cover the walls. All the creepers from the baskets and window-boxes of the summer were placed to the outside edge of the table, and in one month, as we beheld our handiwork, the result was encouraging.

All went well until the cold nights of December came; in the mornings

It is worth while to have a little greenhouse for the pleasure of growing one's own chrysanthemums

Begonia Gloire de Lorraine, one of the most floriferous winter-blooming plants in cultivation

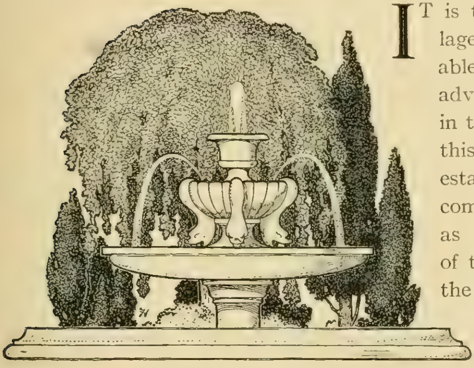
the temperature would go down to forty-two degrees. However, during the day the sun's bright rays would warm up things to nearly scorching point, but to counterbalance the chill that was sure to follow at night I religiously excluded all fresh air, so as to retain all the heat possible. This, we found later, would never do. The temperature must vary but slightly during the twenty-four hours in order to approximate natural conditions. Then came depressing days, and it was feared by those who laughed at us and those who encouraged us that our venture was a failure after all.

One day at lunch we told of our trials and disappointments to a clever young architect who was visiting us, and after a careful investigation of the little building he advised us to send for a carpenter, cut out a small groove on the inside of each window-frame with the exception of the roof, and insert a second pane of glass. This increased our expenditure somewhat, so that we counted that with these extras and the necessary plants to stock the place our expense account reached $200. With the extra glass our troubles ceased, and during the intense cold of our Canadian climate we were able to keep the tenderest plants. Before long our carnations bloomed freely, geraniums, begonias, chrysanthemums and other plants added colour and beauty to our winter garden, and we felt that, had our venture cost twice the amount, we were amply repaid. When the warm sunshine of February came to us, our roses, which we had looked upon as failures, budded and blossomed, and then, indeed, we felt that we had reached success. However, there are two sides to all questions, and there are many disappointing features the first year in a greenhouse, and to all who embark in the venture I will give the quaint definition of "patience" as given by a little Scottish maiden to hang as a motto over the conservatory door: "Bide a wee and dinna weary."

CHAPTER XV

How to Make a Formal Garden at a Moderate Cost

By Warren H. Manning

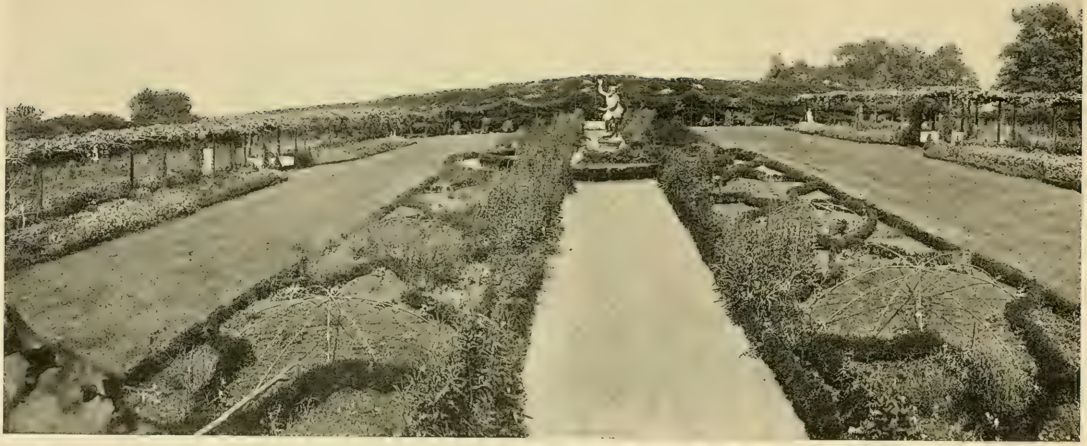


IT is the small home grounds of villages that offer the most favourable opportunities for a marked advance in civic improvement and in the broadening of the home life, this to be brought about by establishing upon the grounds compartments for various purposes as clearly defined as are those of the house and in some of which the same degree of comfort and privacy can be secured. In ordinary village lots such compartments would be the back yard, of which a part would be used for service requirements and a part turfed or cultivated, an area at the side of the house for garden, lawn or terrace, with direct access to the living-rooms, and the front lawn —a continuous, unfenced area maintained for the mutual benefit of the householder, his neighbours, and the public. The public may thus secure vistas over turf between street, trees, and houses. The center of the vistas should be kept open, and there should be, along and between the front lines of the houses, a nearly continuous but irregular belt of vines, shrubs, and herbs. Such a belt, by the continuity of its greenness and its graceful drapery of foliage and stems, brings houses varying in style, size and colour into harmonious relations with each other, with the grounds, and with the surrounding landscape, and gives a relief to the rigidity of architectural lines. That part of the plantation extending from house to house will serve also to screen a garden or terrace from passers-by.

In assigning space to each compartment, provision should also be made for room upon which to establish the border plantations required to shut out unattractive and frame in attractive views, as seen from important viewpoints within house and grounds. In all this study regard should be had for the general composition—that is, the picture to be produced ultimately by the house, with its drapery of vines, its skirting of shrubs, and the trees that form its background and frame in its lawn areas.

Primarily, the architectural character, the general arrangement and location of the house, as well as the arrangement of the grounds, of which the garden, be it formal or informal, is a part, should be governed by the existing conditions. On a very rugged and picturesque site, where the surface is covered with an attractive growth of low, dense shrubs, an unsymmetrical house made to fit into and grow out of the surface with little injury to attractive rock formation and shrub growth would be fitting. Upon such a site a formal garden would be quite out of place, because the cost of construction and sacrifice of another type of beauty would be greater than the return. A distinctly informal garden, with the flower beds in pockets and valleys of deep soil, and where the native shrubbery already established on the thin soil of ridges and ledges is retained, will have a peculiar beauty of its own. A person having such a lot, who can appreciate the beauty of natural conditions, or one having an abandoned quarry or pit and who can take full advantage of such unusual situations, may excite the mild derision of his neighbours for buying a "rubbish hole" and saving "brush,"

A bit of formal gardening—an incidental feature of the Stokes estate at Lenox



An Italian garden at Brookline. Note the trellises covering the paths

but in the end he will turn derision into congratulation and emulation. Except in a comparatively few localities, such sites are rare. Usually lots are so flat and bare that some type of the formal garden is the most feasible as well as the most logical thing, and it is for this reason that particular attention is given to such gardens at this time.

The successful plan for a formal garden must grow out of an independent study of conditions, not a study of ready-made plans. A good plan will be a reasonable thing —that is, there will be an obvious reason for every part of it. You will not put in walks, beds, dials, arbours, pools, etc., because they are pretty, or because you regard them as an essential part of the furnishing of such a garden, as you would regard a frying-pan an essential in the kitchen. Obviously, a pool or fountain without a constant and copious water-supply would be unsatisfactory, and a sun-dial in constant shade would be quite absurd. Now that all animate and inanimate things are given a voice by

Hardy grasses as elements of formal gardening. Mr. Egan's home at Highland Park, Ill.

our story-writers, one should be somewhat cautious about statuary. Just imagine the protest of a nude figure in zero weather!

Do not attempt to utilise discarded material or utensils which one would instantly associate with other uses—such as beer-bottles for the edging of beds, old kettles on tripods painted red and with imaginary fires of stone under them, and old earth-filled stoves with geraniums blazing out of the cover-holes, love-in-the-mist puffing out of the smoke flue, and a front draft exhaling "infant's breath."

A bed of dwarf flowering cannas as seen at the Pan-American Exposition

Above all, avoid the curious and the grotesque unless you are ready frankly to accept the idea that the garden is to be a museum—a place for the display of freaks. When you do this, do not inflict it upon all your friends all the time. A very retired nook behind a very high hedge would be an appropriate place for Alexander Pope's "Imagery in Evergreen Subjects," with which a "virtuoso gardener" would "ornament villas and gardens" to distinguish them from the "barbarous countries of gross nature." Fancy "Adam and Eve in yew, Adam a little shattered by the fall of the Tree of Knowledge in the great storm, Eve and the Serpent very flourishing";

Where both styles meet—the edge of the Italian garden at the Hunnewell estate

"St. George in box, his arm scarce long enough, but will be in condition to stick the dragon by next April; a green dragon of the same, with a tail of ground ivy for the present; an old Maid of Honour in wormwood."

Neither should there be attempted in the flower gardens of small home grounds a pattern in walks and beds so complicated that it cannot be traced by the eye, unless all flowers are omitted from the beds. The very crooked walks and beds of such designs are difficult to care for.

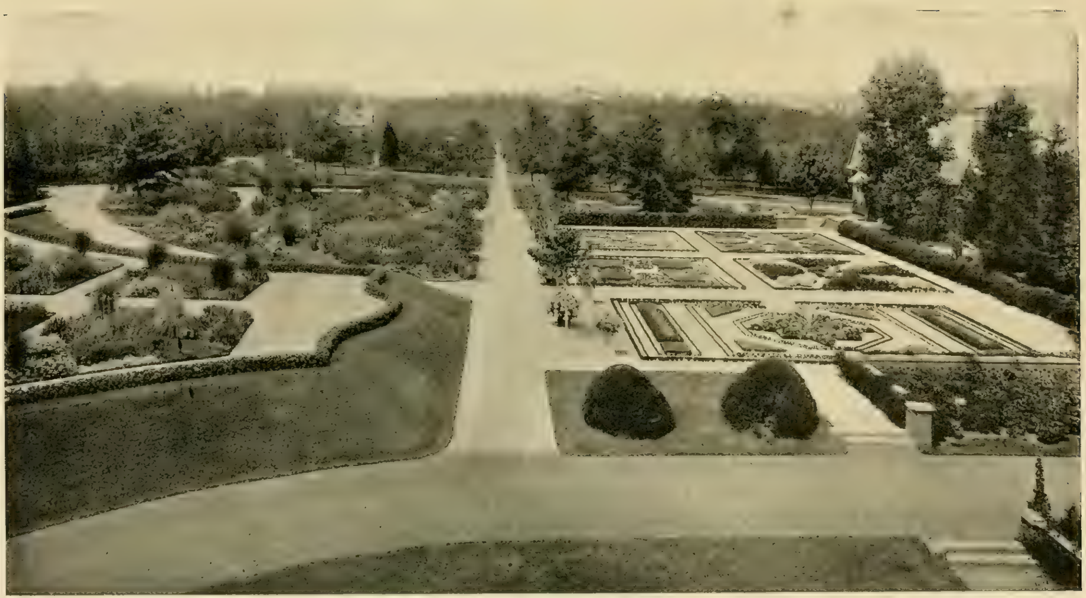
In determining the location, the relative size of beds, walks, and other features, it is the harmony of good proportion and fitness which gives artistic merit to a good design. Good proportion comes largely from intuition; fitness grows out of knowledge and good sense.

In making the design for beds, bear in mind that it is difficult to cultivate from one walk a bed more than four feet wide, or one more than eight feet wide between two walks. If beds are to be wider, narrow walks through the center will be needed. It is hardly necessary to say that beds should be most thoroughly prepared, if the most luxuriant growth, best health and greatest abundance of flowers are to be secured; and as this garden represents a comparatively small part of the lot, such preparation can usually be afforded. Use two feet of good and well-enriched garden soil, with tile drains a foot deeper under each bed, leading to a free outlet, especially in heavy soils. If necessary, accept for the time being the soil as it is with a very thorough spading, with the addition of a very large amount of well-decomposed manure, and then approach the ideal treatment as rapidly as possible.

The width of a walk is governed largely by usage. If a horse and cart are to be used, a walk should be from six to eight feet wide; a wheelbarrow will require a walk three feet wide; if two persons are to walk abreast comfortably, the walk should be four or five feet wide; narrow walks in the center of beds should be from one and one-half to two feet wide. Walks made of a permanent material require less care and are more comfortable to use at all times. A first-rate material is good red brick, laid on a six- to ten-inch foundation of loose gravel, cinders, or sand, with a low crown to shed water. Other coloured brick will in some cases be as good or better. Slate flagging upon the same foundation is good. Cement concrete is neat and clean, and durable if well laid, but the colour is not as good as brick. Tar concrete and asphalt blocks are an abomination in colour. Thin sheets of sandstone, limestone, or other flat-surfaced rocks of irregular outline, make serviceable and picturesque stepping-stone walks when joints are made close enough to prevent

Formal beds edged with box

A modest formal garden in Germantown, Pa.



Two distinct styles of formal gardening side by side

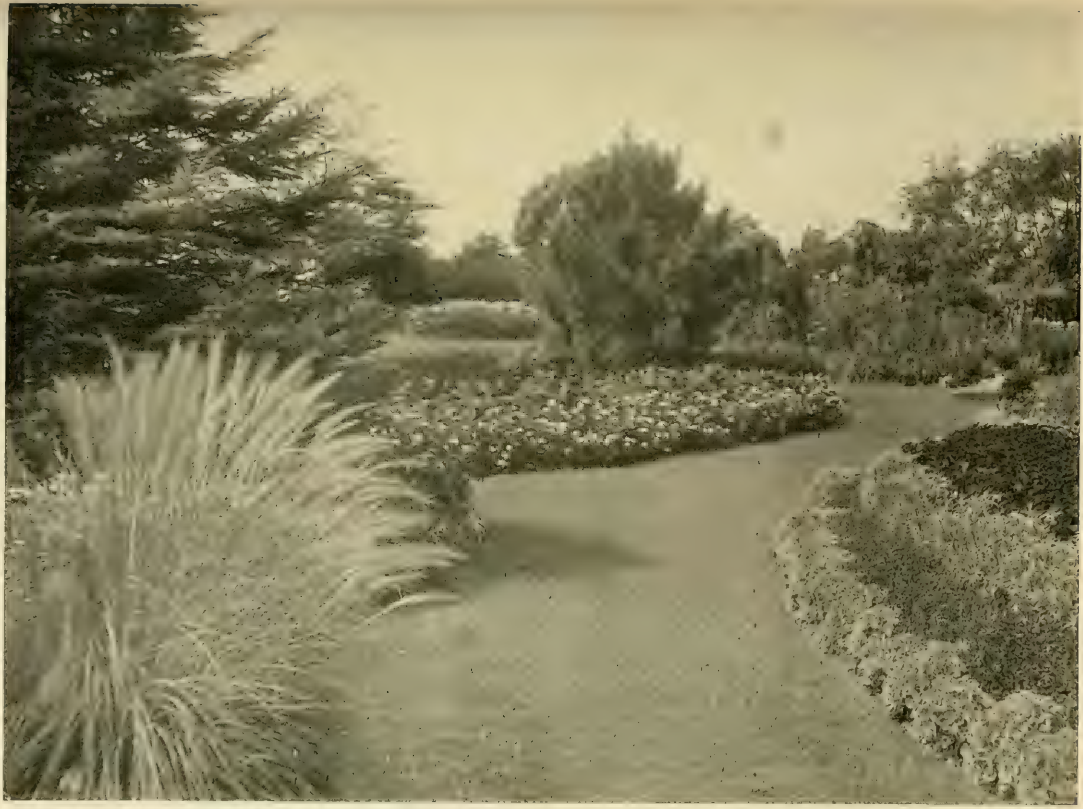
the heel of a lady's shoe from being caught in them, and with edges next to beds made straight. Such a walk should also have a porous foundation. If, however, the cost of such a foundation cannot be undertaken, lay the stones directly upon the soil. If the action of frost makes the surface of stones too uneven, they can be replaced easily. A macadam walk of crushed stone four inches deep, or a similar surface of binding gravel, makes a firm walk, but dirt will track from it to the house, and weeds will grow in it. A surface of smooth, round pebbles is clean and free from weeds, and often gives an excellent colour-effect when carefully selected, but it does not pack well. A turf walk is often used, but it holds the wetness of dew and rain, and it does not sharply outline the pattern of a formal garden, because there is not colour contrast enough between it and the planted beds. If you do not care to go to the cost of such surfacings, use the soil of the garden as a walk. It will be muddy and dusty at times, but occasional mud and dust need not seriously detract from your pleasure.

Stately steps descend into the formal garden

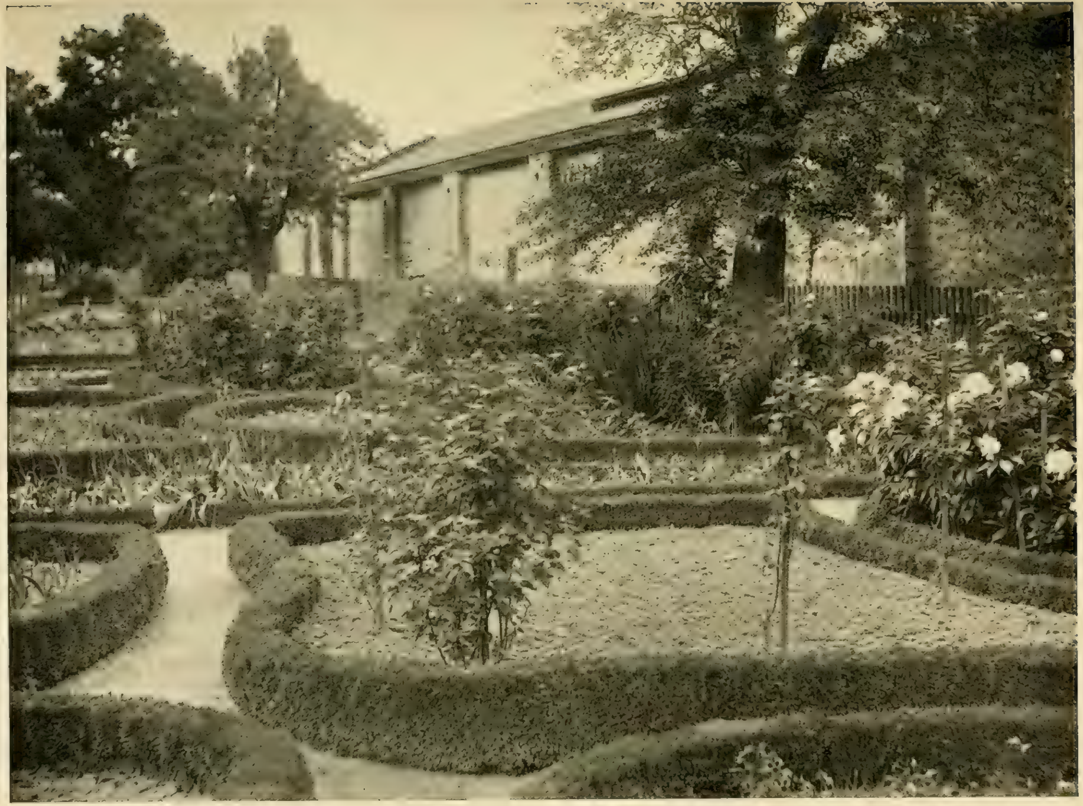
A low, true edge of some material should be formed next to the bed to hold walks and earth in place; and, in addition to this, a verdant edge of such plants as dwarf box, ivy, or the dwarf high-bush cranberry—all of which can be held by trimming to a rigid line. Less desirable as an edging are such plants as the narrow-leaved blue day-lily and the dwarf irises. A turf edge is much less expensive, but it lies too flat to make a distinct line of demarkation.

Water in basins and fountains adds much to the attractiveness of a formal garden if it can be secured to give a constant flow to fountains or falls. A fountain that is put on tap for company is likely to be a snare and a delusion. If your garden is a show-place, maintained chiefly for the benefit of occasional visitors, such a fountain on tap may be all right; but if it is a place to live in, you want the water daily, just as you want the flowers daily. Even if you do not use water as a feature in the garden design, it is very desirable, and in some places quite essential, that you have it from hose connections for watering beds. Where the water-supply is limited, it can be used to make a wet spot for bog plants, or it can be used

Where the sun-dial has the place of honour



A common example of bedding-out. As a piece of bedding itself, this represents a very successful example. It is very questionable, however, whether, as an artistic composition, such bedding is in place on the margin of an informal lawn



Bits of old box hedge, as prim and square-cut as a Puritan pastor

in a shallow basin as a water mirror, in which fishes, but not plants, can be kept, but in which plants grown along the side will be reflected; or as a small stream running from a spouting head into a basin in a wall, from which it will drip to a lower basin with an outlet. If there be a column of water, it should be continuous and strong. In the construction of basins, cement is most serviceable and least expensive. Of course, in winter the water should be shut off; but if, in the construction of the basins, the sides are made flaring instead of perpendicular, the action of ice is not so likely to burst them.

Bulb time in the formal garden

A hedge as a boundary for a garden is appropriate; but, owing to the amount of space it will ultimately occupy, its interference with the growth of garden plants, the trouble of keeping it in good condition, and its lack of flowers, it is usually best to substitute substantial brick or stone walls, if the house be of brick or stone, or wooden fences if the house be of wood. The objection to wood lies in the difficulty of repairing and painting it when covered with vines.

An appropriate place for seats, arbours, sun-dials, and other useful and attractive accessories will be found as the plan develops.

In planting, the purpose should be to establish an effective display of colour in foliage, flowers, twigs, or fruits in their season, rather than a varied and interesting collection of plants—if it is a flower garden rather than a botanic garden that is to be created. This will be accomplished best by using in large quantities the few varieties that will give the best floral or other effects desired, rather than many varieties in small quantities. Obviously, trees or shrubs having a wide spread cannot be used unless trimmed constantly.

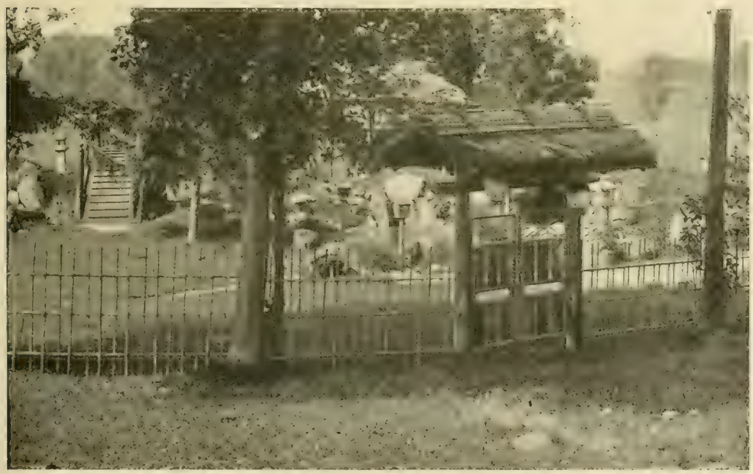
Standard roses and pyrethrums near the greenhouse

CHAPTER XVI. JAPANESE GARDENING FOR SMALL AREAS

I. A Japanese Garden in an American Yard

By William Verbeck

BORN and brought up in Japan, my natural playground was the Japanese garden. I was happy when I drowsed away a hot afternoon under a distorted pine, on the shady side of a child mountain, with a book about elves and dwarfs in my hand; and in my imagination I would people the little hills and dells with the wee folk Later, when the maples were red, a score of my Japanese playmates would join me in mimic war; and, armed with bamboo lances and swords, we attacked and counterattacked, now hiding in mountain fastnesses, now wading through iris ponds. The masking of hill behind hill and the artful vistas of the ancient garden-builder had prepared for us an ideal stage for strategy and battle. As I grew older,

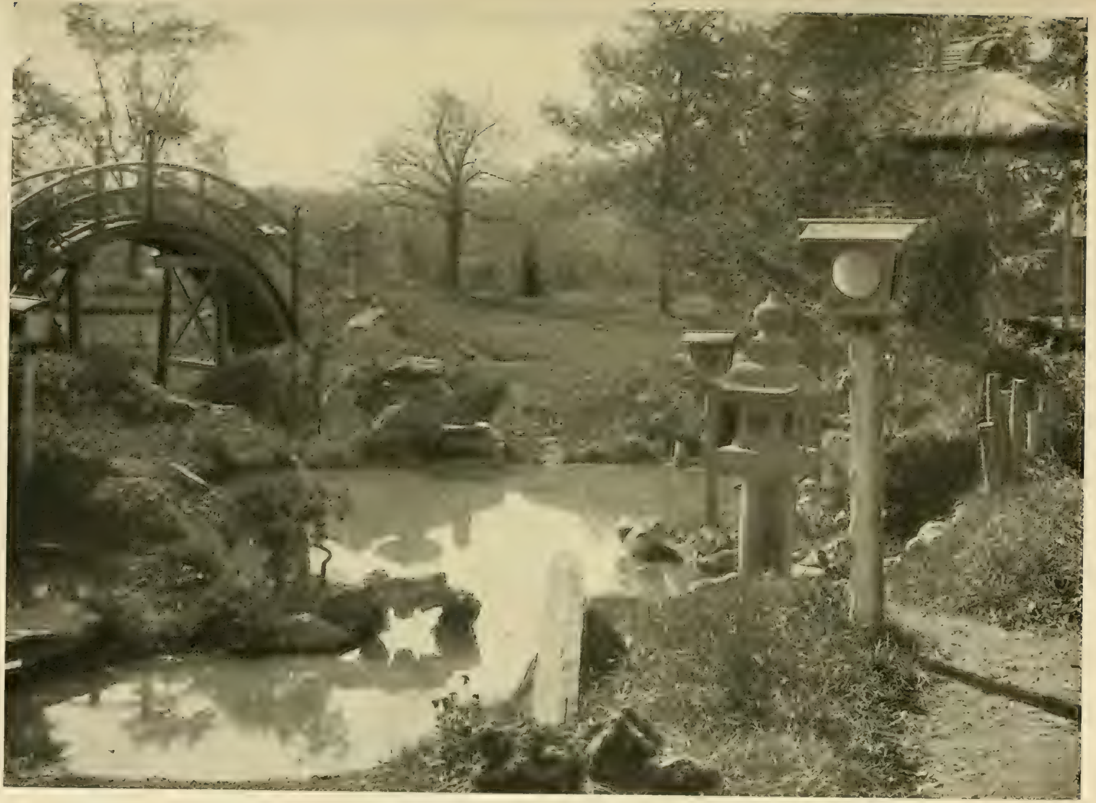


"With rye straw I thatched the gate. My fences were made of bamboo fishing poles tied with rough hemp rope" with my father I explored many ancient gardens of the Daimios; and of these I remember best an extinct garden, grown to seed, grewsome and beautiful, the pond a tarn grown over with a green scum. I learned to love those gardens all, from Hamagoten, the Emperor's summer garden by the sea, to the humblest effort of the farmer to merge a stone, a shrine, and a pine tree into a landscape.

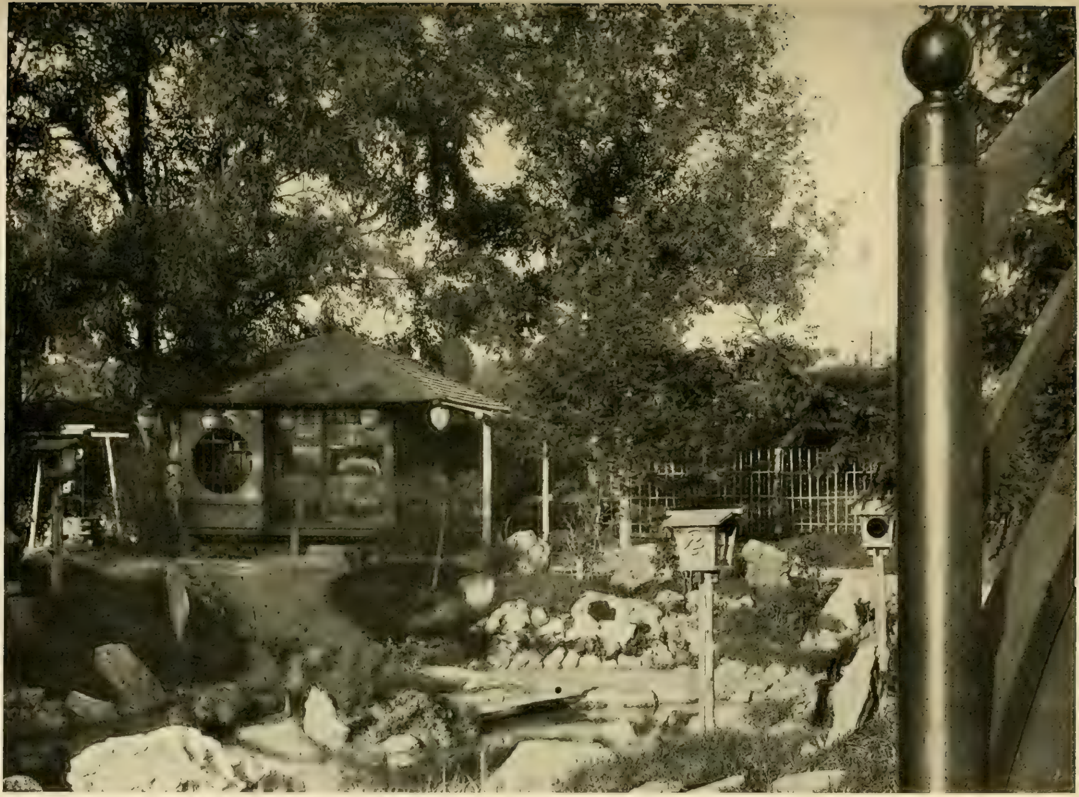
And so when I made my home in America I longed for a genuine Japanese garden. My first one I built behind a school building, in the woods, on a beetling cliff of limestone. Jutting over the rocks I put my summer house. It was fifteen feet square, and the veranda commanded a vista cut through the tree-tops of the valley below. A sliding window in the back gave a glimpse of the dense woods which opened up into a long vista to the north. Instead of paper shutters I used ground glass, as better withstanding the weather. The room had its regulation *tokonoma* and its *chigaidana*—the first an alcove for the hanging scroll, the second a recess for shelves arranged *in echelon*. The walls were first plastered smooth, and then I overlaid them with plaster of Paris, using my bare hands to describe cloud patterns as I approached the ceiling and sea-wave patterns on nearing the floor. Among the waves I set shells and mosses. The whole was built of carefully seasoned pine of selected grain, and oiled to give the appearance of age. I cleared a space of about fifty feet square in front of the summer house, and laid out what is technically known as a "flat garden." I dug out an old brook-bed that meandered through it, and covered the bottom with white pebbles, bordering it with rocks and ferns. A bamboo fence and a rustic bridge completed this plateau.

But I tired of this garden, because I wanted to see and hear real water, and that was impossible on the cliff; so I dragged my little house down to the campus below the school, against a fringe of trees, and remodelled it. I opened up another side for more ground-glass shutters, and added a moon window with cloud slats across its face. I abandoned the flat type of garden and composed something approaching the conventional "hill garden." Because of the difference in the conditions of climate and environment, I found it impossible to conform to all the traditions and laws of the classical Japanese garden. Therefore I treated my subject freely, and followed the spirit rather than the letter of the conventions.

The classical garden, like a sonnet, is governed by special laws of harmony and rhythm. It must have its five hills, its ten trees, and its fourteen stones



"I built an impossible red bridge over the dry arm of the lake"



"I laid out an irregular square one hundred feet in each direction, and into it crowded about an acre of view"

—and the greatest of these is the stones. You can get along without hills, and you can get along without trees, but you cannot get along without stones. Indeed, the perfect type of the flat garden is nothing but an archipelago of rocks in a sea of white pebbles. The stones must be the foundation; the rest are mere accessories. Speaking stones are what is wanted—stones that suggest moods and passions for the Japanese recognise that there are sermons in stones. Each stone has its name and relative place in the composition. There is the Guardian Stone in the center, and opposite it the Belleview Stone. Across the cascade is the Moonshade Stone, and so on in orbits around the grand key are the Throne Stone, Worshipping Stone, Snail Stone, Idle Stone, and so on.

The hills unmask each other by rule. The principal hill has its two foothills, its spur hills, its distant peak seen through a valley, and the low hill that must stand on the opposite side of the lake.

As there is a principal stone and a principal hill, so must there be a "principal tree," the *shojin-boku*, around which the Tree of Perfection, the Tree of Evil, the Tree of the Setting Sun, the Tree of Silence, and the Tree of Solitude bow their lesser heads.

"I wanted to see and hear real water"

These are the essentials. Now add one pond, one island, two stone lanterns, three bridges, and mix thoroughly, garnish with lotus, and serve with goldfish and mandarin duck. There is a recipe for the classical Japanese garden.

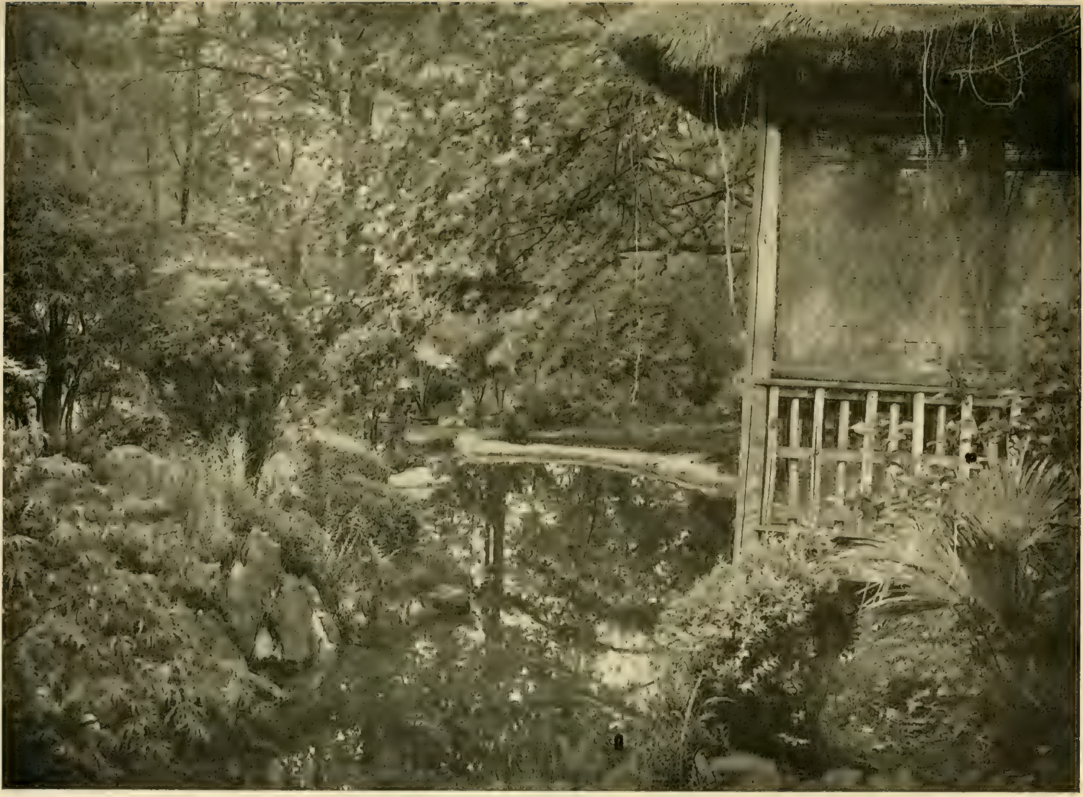
To return to my American translation of the Japanese garden—I laid out an irregular square one hundred feet in each direction, and into it crowded about an acre of view, and by exaggerating the perspective produced depths of vista such as might suggest glimpses through the wrong end of a telescope. In the center I placed my "Dedication," or key-stone, a ragged slab on end with a bold, smooth face, ready for inscription. Following traditions, I placed my garden with its back to the north; and from the other three points of the compass I made sketches, each with salient features invisible in the other two. From these "elevations" I blended a "plan." The lakelet and the hills were then staked out in no haphazard way. For every inlet there was a reason. Every hill formed a screen of malice aforethought.

The lake was made about fifty feet long, well grouted and gravelled, to hold a foot of water. On the west side three immense stones formed the entrance to a cave into which the waters of the lake followed, or, more properly speaking, out of which the waters poured. The plashing of a hidden waterfall came out from the cool of the grotto. A second source of supply was arranged to creep through the dry lake to the south, grown with rank weeds and iris. The third supply was in the shape of a small mountain torrent shooting under a rustic sod bridge. Then the electricians buried their wires, safely protected from moisture in lead pipes, and leading to fifteen standard lanterns. Here it was that I fell from grace in not adhering to the strict traditions of the classical garden. My desire for fairy effects turned me to the more plebeian models, and I found in the tea-garden an excuse for illumination. I therefore added a dozen wooden-post lanterns to my three monumental stone lanterns.

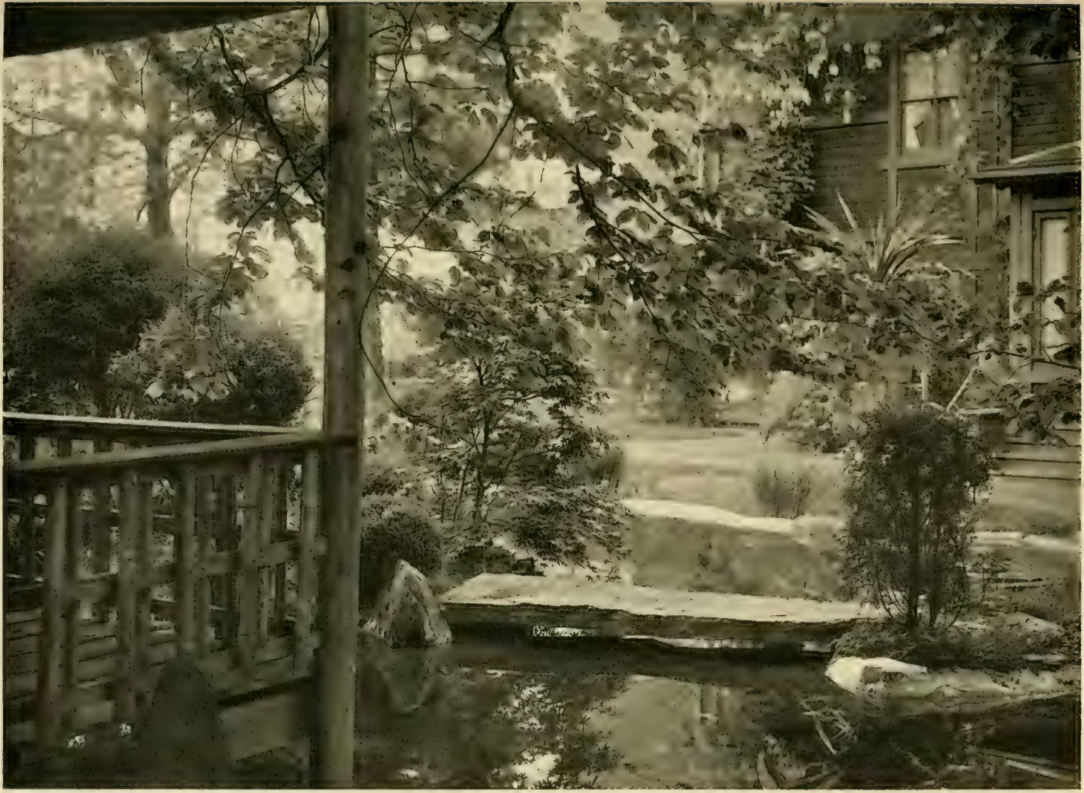
My "principal hill," eight feet high, was built over the grotto, and with two foothills formed a crescent chain of mountains against the lake The foothills were sundered by a chasm bridged over with a great stone slab.

Then came the placing of the stones. With no professional landscape gardener to hamper me, and with the assistance of a stone-boat, an intelligent team, a stupid driver, and my ordnance sergeant, who had learned obedience in the army, I revelled in stones. I planted and replanted; I squinted down lanes and vistas until each stone satisfied me.

With rye straw I thatched the gate in the north, and also a second summer house on the Principal Hill over the grotto. My fences were made of bamboo fishing-poles tied with rough hemp rope. I built an impossible red bridge over the dry arm of the lake. It is a facsimile of the one in the Wistaria Garden at Kameido, Tokio. Here again I borrowed from the "pleasure garden," but I needed a bit of colour to balance the red sacred gate leading to my fox-god shrine at the northern end.



Glimpses of a Japanese garden near Philadelphia



Another view of the same garden, showing the possibilities of Japanese gardening for small city yards

In building this bridge I am afraid I have laid myself open to the same criticism that might be made of most Japanese gardens in America, which are generally too lavish in bronze storks and expensive dwarf trees. They remind me of the new florid style of Tokio pottery, manufactured for the American trade, and not at all like the subdued grace of the old Satsuma ware. Though I have some few Japanese plants, the tree that looks its part the best is a grotesque lilac which I found in the back yard of an adjacent farm. The garden as it stands has cost me, including everything, about one thousand dollars. When once installed, the expense of keeping such a garden is slight. As the elements beating upon the summer houses weather the unpainted wood, so does every freshet add character to the outlines of the hills and brooks. The last cloudburst did more for my garden than my whole summer's work.

II. The Japanese Garden in Golden Gate Park

By C. H. Townsend and E. C. B. Fassett

There is probably no scheme of gardening which offers greater possibilities for diversified arrangement within a limited space than that followed by the Japanese. It is essentially landscape gardening requiring an uneven surface—there must be hills and valleys, groves and open spaces, rivulets, pools, rocks, and whatever is suggestive of the natural landscape. Much that is formal is introduced in the way of bridges, buildings, stone lanterns, bamboo trellises, and potted trees. Taken as a whole, the features which compose it are all more or less in miniature, excepting the original trees of the locality and the buildings. Being a representation of the scenery of a country within narrow limits, it is in reality a condensed landscape. Notwithstanding the high degree of art upon which it depends, it is much more natural in conception than the gardens of other countries, with their clipped box hedges, walks, and growths of all kinds in straight rows or in exact mathematical curves.

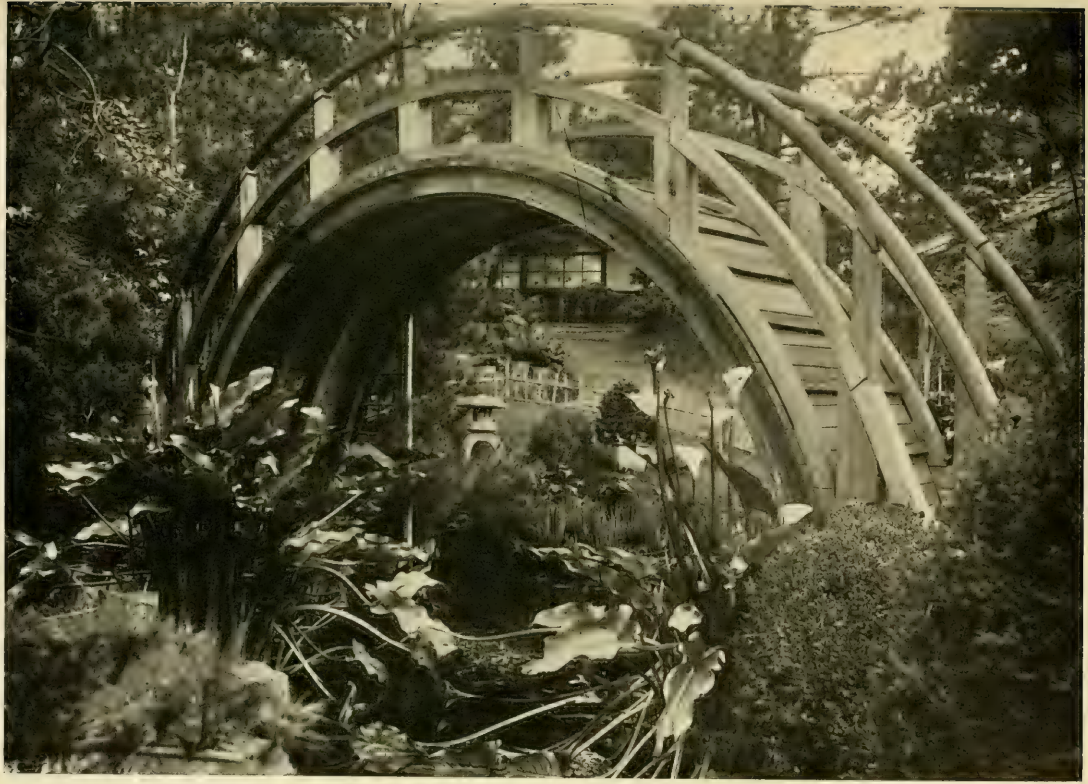
The Japanese garden has been little more than an experiment in this country. There is a large and notable one in Golden Gate Park, at San Francisco, created as a Japanese exhibit at the Midwinter Fair, in 1893. This garden comprises a half-acre of hillside, on which are groups of scrubby pines from twenty to thirty feet high, and is enclosed by a unique fence in natural wood with a coping. A grade, leading up from the park roadway to the temple-gate entrance of the garden, is dug into low, broad steps, each earthy terrace supported by a row of cobbles. Although said to be not entirely correct as a Japanese garden gateway, the entrance structure is a thing of beauty, its quaint contours and the weathered gray of its timbers appealing at once to the eye.

Within the garden there are two thatch-roofed tea-houses overhanging fish-ponds, where tea is served by Japanese women in native costume. As you drink tea in the garden, you naturally share the crisp Japanese cakes with the expectant goldfishes clustered below. On higher ground in the rear is a Japanese house.

The ponds are supplied by a stream that comes trickling most naturally down the hill over its artificial stony bed. The stream is the overflow from a rock-built well-curb into which water splashes from a couple of well-buckets, the rope suspending them being in reality the pipe which conveys the water from a distant reservoir. A mass of bamboo and pine conceals three sides of the water source and gives an air of sylvan retreat. Visitors are inclined to follow the course of the artfully natural stream as it tumbles in cascades over the rocks, or widens into pools crossed by arched rustic bridges, or narrows where just a stepping-stone suffices for a crossing. In the pools water-plants flourish, and along the rocky banks are ferns, mosses, lilies, and other suitable plants, with here and there an overhanging pine branch.

The miniature lakes have the irregular shore outlines of natural lakes, and lie in well-diversified country, if the term country can be applied to so limited an area. Their shores are low in places, with grassy margins, and high in others and covered with shrubbery. Here and there are little groups of stunted Japanese pine trees only a couple of feet in height. The ponds are really quite shallow, probably not more than a foot in depth. After being dug, they are paved with stones, the paving extending up to the shore margin, and the entire bottom covered with cement to prevent the accumulation of mud. Their bottom levels are so arranged that they can be readily drained and cleaned, and, being of small size, the flow of water is sufficient to prevent their becoming stagnant. The rustic bridges are of proportions suitable to their surroundings, but all wide enough and strong enough to carry passengers in single file.

Along the walks, sections of low bamboo fencing are created, doubtless more for the purpose of ornament than to protect the tiny lawns. A high



There are robust clumps of calla lily in the miniature pond beneath the semicircular archway of the high rustic bridge

bamboo fence covered with wistaria encloses a yard containing a pair of cranes—white, with black markings—that look as though they might have just alighted from a flight across a Japanese fan. Paths, rather wider than those of gardens in Japan, are introduced of necessity, as this garden is quite a public place. Where the walks lead over uneven ground, low, broad steps are cut into the earth, each being banked with a log cut the width of the path.

One would never know it was a square garden until after complete exploration, as only a part of it can be seen from any single position, owing to the distribution of its knolls, larger trees, and buildings. Much of its charm would doubtless be lost with any cutting away of shrubbery that would reveal more to the eye and leave less to the imagination.

A garden of this kind is one of constant study and development, and becomes to the Japanese a little land of poetry, full of quaint symbolism and refined ornament, appealing to the higher senses. To know this garden is to love it, and its subtle charm does not fail. Of all restful places, it is most so, and, though of small compass, there are many points of view, with seats artfully placed, where pleasing vistas reward the eye. There are a score of garden-lovers in San Francisco who feel that they must visit it at least once a week and watch Mr. Hagiwara, the gardener, at his work.

In a certain city a library window that once looked out on a thirty-by-forty back yard of the plainest description—a typically dreary back yard—now offers a view of a tiny Japanese landscape where moderate-sized stones represent boulders and bushes stand for trees. The stepping-stones are small, it is true, but they lead around knolls and bits of shrubbery and across a tiny bridge. A bamboo trellis above the board fence supports vines that shut from view everything undesirable.

A friend with whom we drank tea in the San Francisco garden has written this: "I have a Japanese garden growing in my mind. Some day the painted wooden steps leading up past the side of the house into the yard in the rear will be replaced by rough stones. Farther back the planks must come up and be burned, and there shall be irregular stones to step upon. Ferns and small pines shall grow in porcelain bowls, and there will be some mossy stones in the corner where it is always shady. Bits of bamboo trellis with wistaria shall serve as screens where the outlook is unsightly. Pines shall grow on the north terrace and make silhouettes against the sky. The useless shed shall somehow be converted into a Japanese summer house.

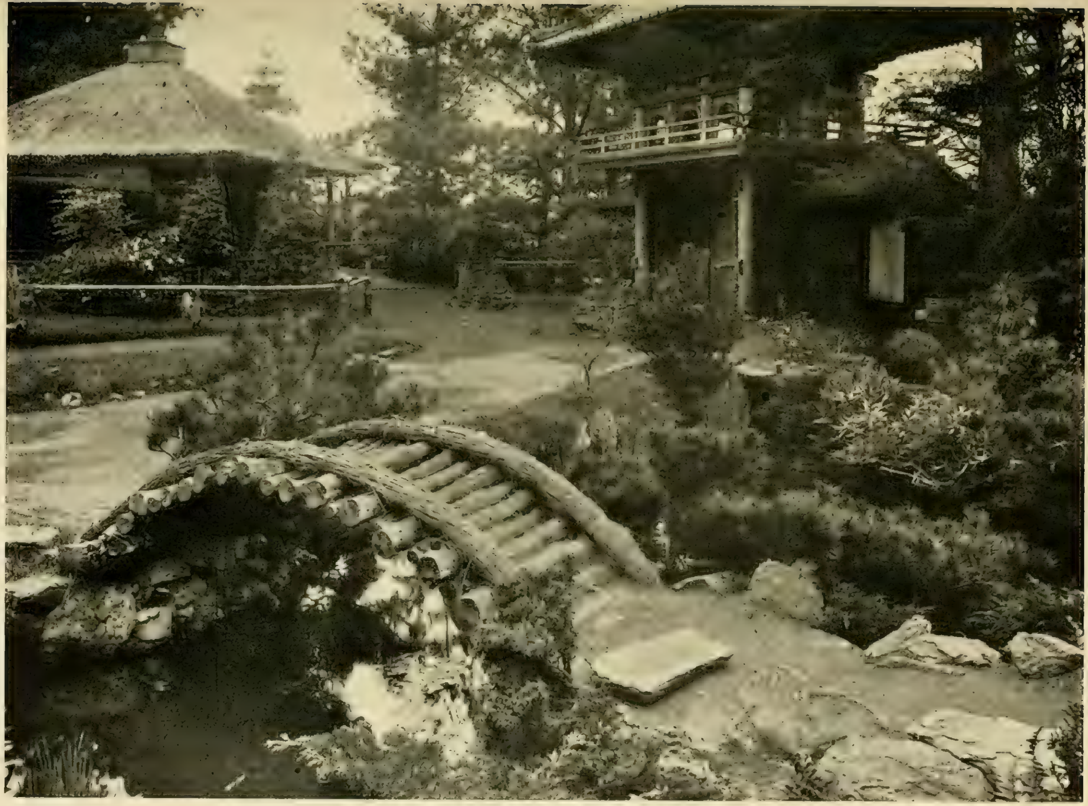
I have already located some shrubbery that will be transplanted. At the top of the steps a *torii* will invite entrance, and I will have a stone lantern—a real *ishi doro*, even if it has to be made to order. I know just what trees to plant for blossoms, and a little pond in a sunken tub will hold some water-lilies.

"I'm sure to find a unique little boulder to set up somewhere, and it will be the easiest thing in the world to get earth for a little mound hill. There will be double windows, and in the days to come I shall sit in Buddha-like contemplation of pleasant things, and great serenity shall settle upon my soul."

As one enters the garden there is first an open, level, sanded area, its irregular limits surrounded by small grass-plats, ponds, and the more stunted vegetation, with the bridges, tea-houses, and larger trees farther back, and many paths with earth-cut steps up the grades that rise from the sanded area to several parts of the higher grounds. A wistaria projects beyond the eaves of the tea-house, and trellises for vine are of bamboo, supported by posts six feet high. Against the rear wooden wall of the garden rises a receding tier of heavy wooden shelves, from which grow many varieties of dwarfed pines in porcelain pots.

The original pines in the garden, still erect in their natural symmetry, are stripped, one by one, of their Californian simplicity and taught to wear the art of Japan. Each tree is studied by the quiet gardener. Its possibilities as a part of its surroundings are carefully worked out and it is put to torture. Its young limbs are racked and its back bent until it is transformed into a creature of weird fantasy. A well-rounded young pine tree must be cultivated and cropped; its limbs must be bent and altered, lopped off on one side near the top and on the other near the base, until it looks as aged as a veteran of the hilltop after the buffeting storms of years.

Fancy grooming the foliage of a pine tree! Yet this very thing is done by boys in the branches, who pull out the old leaves till only fresh green ones remain. Here they saw a branch to let in light and a shapely patch of blue sky, and there thin out the twigs to leave a fret of pine needles against an azure ground. Likewise effective vistas are opened up through the scraggy pines. The limbs of the trees, on close inspection, are seen to be twisted and braced to produce the picturesque. Each gracefully reaching branch in the training is often splintered with bamboo and tied fast with numberless hempen strings. As the twig is bent, so grows the tree, and its large branches



The temple gate at the entrance of the garden

by gentle but persisted suasion. The individualised graces thus imparted to each branch excite esthetic emotions, even in those who have no knowledge of the symbolic suggestions thereby conveyed. The Japanese hold a worshipful attitude toward "the honourable pine," and their never-ending care produces results which are a revelation.

Blossoming plants are selected with care to bloom in rotation. At one visit you find the garden with azaleas not great bush shrubs, but dainty, well-bred plants, each blossom perfect and of exquisite colour. Another time the Japonicas alone are in evidence, but in such harmony that one forgets other flowers have bloomed there. Still again, some time in February, pink flowers burst forth from the twisted branches of the dwarfed almonds, and after these bloom the plums and cherries. In the autumn there are chrysanthemums. It must not be understood that flowers are numerous at any time. One of the charms of Japanese gardening, as of art, is the simplicity and freedom from overcrowded variety; they subordinate lesser things to a single point of interest. They insist upon restful spaces, and the beauty of a single spray must be revealed and emphasised.

The Japanese garden is more than a flower garden, and its attractions are not confined to the brief season of flowers. In winter it is not a waste of broken-down stalks. The pines in their quaint and weird forms are there in winter as in summer; the pathways among the evergreens and boulders, across the bridges, and under the arches, still bear the alluring aspect of a garden.

Even the fences are always important in the decoration. The minor enclosures are of bamboo, while the fence enclosing the garden is made of weathered wood, showing the natural grain. The buildings also show the knots and grain of the wood. Paint is not used on any of the garden's structures.

Single flat stepping-stones are much used by the Japanese, and they are placed so artfully that one naturally follows their meanderings. The paths must suggest the most natural courses from point to point. But neither the fences nor the paths are straight, if the gardener thinks the topography will permit of their being made otherwise. Japanese stone lanterns are effectively placed in favourite locations, such as on small islands or overlooking the water.

It is the gardener's art to place the seats, arbours and summer houses for the best views of the garden's attractions. Openings are made through the shrubbery to offer inviting glimpses beyond, where some one thing is given prominence, although it may be only a fine boulder or an artistic roof over a drinking basin. The boulders, in the beauty of this natural roughness, are emphasised after they have been located by the Japanese gardener. No art of the stonecutter could make them more attractive, while the use to which some are put compels approval from its very genuineness.

Stone lanterns, porcelain bowls and wooden structures vary the scheme of decoration with their shapes outlined upon the somber foliage. The *ishi doro*—the stone lantern, the *torii*—the archway with double timbers across the top, said to be an invitation to the birds, are, like other structures in the garden, full of meaning to the Japanese, but these decorative accessories do not convey to the foreign mind so much that they could not be dispensed with and the simple garden adopted at its real value as a natural scheme.

The Japanese create even smaller models of landscapes—gardens so tiny that they may occupy no more space than the top of a good-sized table. In these the merest pebbles do duty as rocks, a capful of stones will construct a cliff, and a bunch of small plants serve for a forest, while the paths and streams may be spanned by a finger's breadth.

Landscape gardening is said to have been introduced into Japan from China, where Buddhist priests had created miniature landscapes in the temple gardens. It was to this end that the dwarfing of trees and shrubs became a necessity. The artistic purpose was to copy the attractions of a true landscape and to give the impression that a real one conveys. It stands for a picture, not merely to look upon, but one to stroll about in and to be enjoyed from within the picture itself. The Japanese garden is as much an art creation as is a painting.

There are several styles of gardens in Japan, having in common many names and much folklore, but they are also individualised as the gardener —a poet or priest, as he may be—endeavours to express some mood of nature. There are "hill gardens," or "flat gardens," in their various "rough" or "finished" fashions, and there are trees for a framework of foliage, or stones for the laying-out of a ground-plan. Perhaps by the reading of this sketch of a transplanted Japanese garden in America some one having a patch of rugged ground covered with trees and bushes may be tempted to convert it into a garden somewhat of the Japanese pattern.

A pair of cranes that look as though they might have just alighted from a flight across a Japanese fan

CHAPTER XVII. WILD GARDENS

I. Wild Gardening in a Small Area

By James J. Allen

I CANNOT remember ever to have seen the gentle art of wild gardening numbered among the kingly sports, yet of them all there is perhaps none more worthy of the name. When we read in Mr. Robinson's entertaining book how whole estates may be devoted to its development, we can understand how the ideal wild garden may call for time, money and elaborate equipment such as only those of princely birth and fortune may be presumed to possess But it is not of such extensive affairs that I purpose to speak, but of a modest experiment of my own, one quite within the reach of any purse, and calling for no more of royalty than inheres in any citizen who exercises sovereignty over his own back yard. In fact, mine is such an unpretentious little thing that I am hardly worthy to be called a wild-gardener, and it may be thought presumptuous for me to speak as if I was an accepted member of the guild. Still I have noticed that the true wild-gardener is to be recognised by certain qualities of the mind and heart rather than by the number of acres over which his possessions extend. If he delights in the out-of-door life; if he prefers the field laughing with daisies and spotted with Queen Anne's lace to the regularly laid out garden he exhibits some of the hall-marks of the brotherhood. There is hope for him that he may yet attain to that attitude of tolerant contempt for all purely conventional gardening which is the distinguishing characteristic of the wild gardener. There never yet was one at all worthy of the name who could abide a regular flower-bed. Your prim and formal border is an abomination to him, and it is a settled canon of his cult that wild gardening bears about the same relation to the ordinary kind that epic poetry does to the roundelay. And I take it to be some evidence of inward grace and worthiness that the feeling appeals to me as by no means indefensible. Just as if there were not beauty enough in the individual flowers, but we must strive to construct out of them a lot of formal beds, designed after the latest oilcloth, and in which the subtle and delicate beauty of the parts is lost in the commonness of the whole!

It is much the same as if the masterpieces in the Uffizi were grouped together so as to reproduce the mosaics in its pavement, and all the sweetness of Fra Angelico, the grace of Raphael, and the power of Buonarroti were sacrificed to the mediocrity of a Greek border. If one can imagine how Ruskin would have felt over such an arrangement of the masters, one can understand how it is that all lovers of the wild garden the world over go back to nature for their inspiration, and echo Mr. Robinson's prayer for deliverance from the "death note of the pastry cook's garden." But to our subject.

Adder's tongue, or dog's-tooth violet

The country home faces upon a street in a little rural community not so far from New York but that the proprietor of the wild garden, who works for a living during such intervals as his royal pastime allows, has no trouble in passing daily back and forth. From the side and rear the house looked out upon a piece of waste ground which, until my novitiate began, had been abandoned to the sumac and the bramble. This was separated from the cultivated garden and the road by a terrace four feet high, surmounted along its entire length by a trellis covered with sweet peas. Behind this trellis and the bank the seclusion was complete. It was here that I started the wild garden, working entirely screened from the road, while my two young but enthusiastic assistants sat in the shade and offered advice upon the various problems of floriculture as they presented themselves.

I commenced by uprooting the briers and the sumac bushes, being careful to preserve such natural features as the place possessed. A couple of boulders were rolled into picturesque positions, and clusters of bushes were left standing here and there. In one corner near the house a clump of tall white birches grew directly out of the terrace. Another corner was filled with a dense growth of staghorn sumac. Not far off was a fair-sized maple. These furnished shade, so necessary where forest-loving plants are to be naturalised. But by far the most attractive of the natural features of the garden was a wild grapevine with gnarled and twisted stem, as thick as one's wrist, which had clambered up over a couple of birches, covering them with its interlacing arms and bending them over by its weight, until they formed a natural arbour of great beauty. Two wild cherry trees standing nearby furnished convenient support on which the birches leaned when the midsummer wealth of leaves and fruit made the vine too heavy for them to bear. From a little distance off it rose above the surrounding bushes with the symmetry of a dome, the broad, overlapping leaves covering it as with tiles. Beneath was a veritable bower, at all times shady, and a spot presenting many possibilities. Such were the prominent features of my wild garden, as yet uninhabited except by the ever-present daisy, the goldenrod, and the aster.

The task which now presented itself was to fill this up—to bring from forest and meadow and swamp every plant that was "pleasant to the sight," and make it to grow in the garden. The work was commenced in the early spring, and the hepatica and the violet were planted in masses beneath the vine-covered birches. Here, too, I set out in favourable positions, under the tangled lower branches of the trees, colonies of the pink lady's-slipper and of the showy orchis. In the shade of the maple were naturalised the mountain laurel and the wild azalea, with such success, too, that both bloomed the season after transplanting. Along the fence the wild sunflower was started, and it has grown since with increasing profusion. Under the cluster of birches near the house I commenced a fern bed, and in early May excited

Rueanemone

the mild amazement of the cows by wheeling up through the pastures where they grazed barrow-loads of unfolding fiddleheads. Among the ferns were planted the trillium, the pyrola, and a few stalks of the graceful, if evil-scented, cohosh. Out in the open lot, and just close enough to the maple for its swaying branches to give alternate sun and shade, I established a fine colony of wild bergamot. The flowers were found in a distant field, where they grew in great irregular masses, like a lake of lavender in a sea of green. With great labour I brought a quantity of the roots home. All about them I spread a broad, thick mat of creeping thyme. The next year, when both came up in their beauty, the picture was well worth seeing. Verily, no Oriental monarch sits upon carpet more magnificent; nor can the looms of Wilton nor of Brussels nor of far Bagdad produce its equal! At all times an exquisite green, there comes a day when myriads of unsuspected buds blossom into simultaneous beauty, and presto! the "bank whereon the wild thyme blows" rivals in its carpeting the tapestries of Ormus and of Ind.

Beside one of the boulders a populous little community of the Venus's looking-glass was planted. To my mind there is something peculiarly attractive about this little plant—an out-of-the-way something that baffles definition. With its slender, tapering spires, curiously turned and clasped at regular intervals by circular, shell-like leaves, each with its star-flower seated on the stem, it is enough different from everything else to suggest no analogue near at hand. I have studied them often, unable to satisfy myself whether they resembled more a forest of diminutive totem poles or a village of liliputian pagodas.

Out in the blazing sun the gorgeous butterfly-weed spread its orange blossoms above the grass, an attractive flower, and so plentiful that one would think none easier to procure. But let me warn any enthusiastic proselyte, with all the earnestness that the memory of aching back and blistered hands can give, that it is easier to draw up leviathan with a hook than to raise the obstinate asclepias from the depths to which its fleshy roots go down.

A fallen tree or an old stump is an invaluable possession for a wild garden. No matter how bare or unsightly at first, the Virginia creeper or the Virgin's bower will clothe it in a year or two in draperies that nothing can surpass. Just under one edge of my grapevine I placed a curious stump that I found in one of my rambles near a neighbouring lake. I astounded a native by paying him twice his charge for carting it home. Had he known my delight over its discovery he might have exacted fourfold with impunity. But I managed to conceal my eagerness under a most indifferent exterior, and thus the tide of opportunity in the life of one rustic passed unnoticed. The stump was hollowed out with age, and shaped somewhat like a boat. Filled with leaf-mould, it makes a picturesque habitation for the partridge vine, the flowering wintergreen, the pipsissewa, and the smaller ferns. All along one side it rests upon a bed of moss, and near it I have inserted thirty or forty roots of the false Solomon's seal. Back of these a more pretentious fern bed has been planned. Here great masses of the interrupted fern have been installed, along with the ostrich fern and the stately osmundas, the tall varieties in the rear and sloping down to the shield ferns and the humble polypody in front. Next year, if all goes well, that corner embowered beneath its vine, and flanked with ferns, will be as charming as Titania's dell. Even this year it was full of interest. If one had gone there in the early spring, before the buds on the birch trees had burst or the grapevine put forth a single leaf, one would have found the ground purple with hepatica, planted the year before. They had hardly gone when the violets took possession. A little later, beneath the tangled lower branches of the trees, a number of stout green cones could have been seen pushing their way up through the mould. These were the lady-slippers and the showy orchis. All winter long I had been wondering whether the spring would call them into life again, so that now I watched the unfolding of the pairs of broad, oval leaves with intense interest. Probably a dozen of each had been set out. All came up, and more than half of them bloomed as naturally as in

False Solomon's seal

their native wilds. Indeed, nothing could be more lifelike than the low purple and the white spikes of the one and the nodding pink bags of the other, as they grew amid the tangle of dead twigs about the foot of the trees. To see them growing there in their freshness one had to pinch himself to realise that only a hundred feet away was a much-travelled road, lined with street lamps, and that just beyond the terrace was a most conventional and ladylike border of coleus, geranium, and the like. This was my first great triumph. I had brought to my very doors a bit of woodland life such as Nature reveals, as a great favour, to a chosen few—something which only those who seek her in her most secluded haunts are ever permitted to see.

Trillium grandiflorum, with toothwort in the foreground

The most serious difficulty with which I had to contend in the construction of my wild garden was the lack of natural moisture. A small pond or running stream is almost a necessity. So many of our most beautiful wild flowers live in the lush lowlands that a garden that cannot at least approximate those conditions must perforce forego many a handsome inhabitant. Of course, in my modest patch of ground, with its total area of little more than a city lot, lakes and rivulets were things merely to be dreamed of. Even so homely a matter as a bit of swamp was beyond my power of production, all efforts to that end resulting in nothing better than a mudhole. The best I could do was to build of stone and cement a rectangular tank, which I connected with one of the leaders of the house and thus made it do service as a miniature pond. With the aid of the garden hose I had no trouble in keeping this full, and the overflow kept the ground below it at all times fairly wet. In this tank I placed the yellow-spattered dock, the purple pickerel-weed, the arrowhead, and the white water-lily, all gathered from a lonely pond in the woods, and in one end a compact mass of wild forget-me-nots, lifted from the margin of a nearby stream. In the wet ground were planted the early spring cress, the painted cup, and a little later on the pitcher plant, the purple-fringed orchis, and a dozen or more specimens of the pogonia and the calopogon. Surrounding these were placed the taller and more vigorous of the water-loving plants. At one end I put several stalks of the tall meadow rue, and about them a few plants of the tawny touch-me-not. Back of these I massed the cardinal flower and the great lobelia. Along the edge and farther from the tank grew the hyssop skullcap, the purple vervain, and the yellow sundrops. At the other end a great quantity of the blue flag was set out, and a little way off a thrifty bunch of marsh marigold. During the year of transplanting all did well, for I was careful to keep everything wet. But I knew that the test would come in the fall, when the country house would be closed and the delicate plants would be left upon a dry hillside, with no other moisture than the natural rainfall until the following spring.

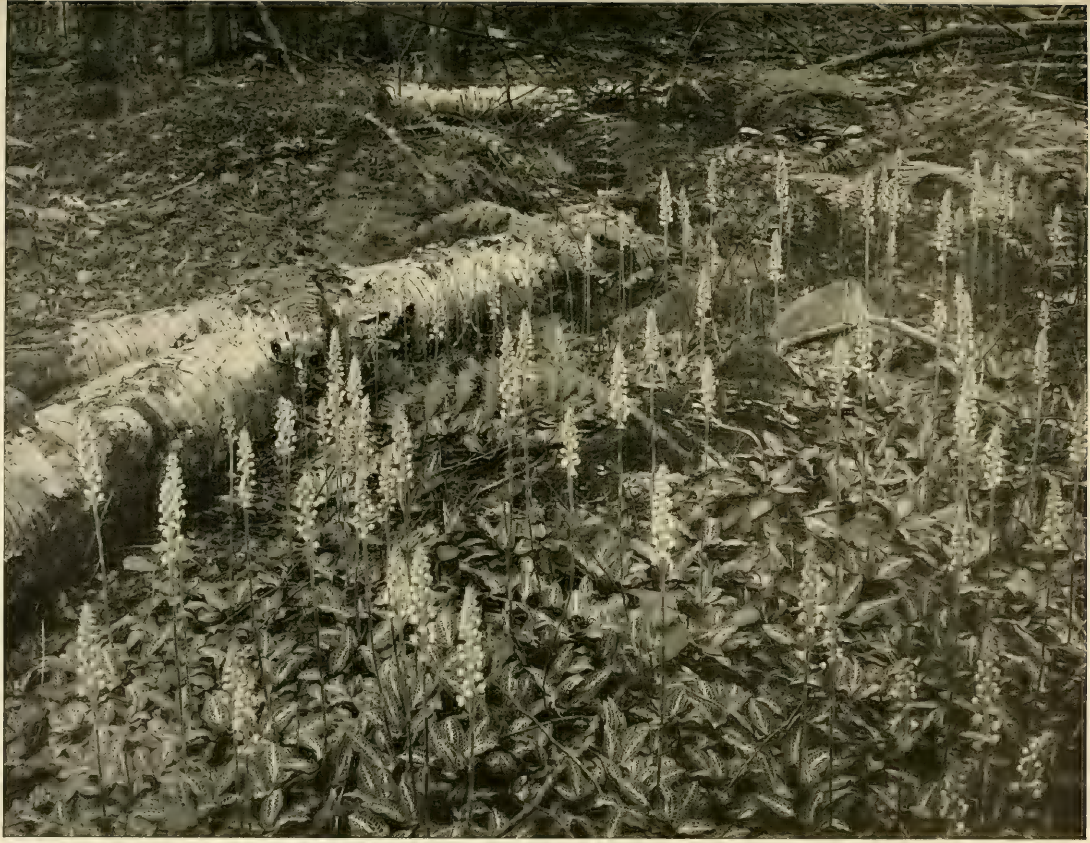
As I might have expected, with the more tender flowers I failed. Such of the pitcher plants as survived the winter sent up a few lean and impoverished pitchers, but none of them had vitality enough to produce a flower. To my surprise, half a dozen pogonias and a few calopogons struggled to maturity amid the

Commonest and best of the goldenrods (Solidago Canadensis)

grass, and bloomed. Exquisite in colour and fragrance they were, but it was easy to see that in the adverse conditions in which they were placed they were not the "fittest" that were destined to survive. With the flowers of more vigorous habits I succeeded better. The Joe Pye weed grew like the fabulous beanstalk. The blue flag was a mass of colour, and right in the midst of it a sturdy buttercup scattered its golden disks in all directions. This illustrates one of the happy accidents of wild gardening, for many a root is brought in unawares, to grow to maturity and surprise us some morning by flaunting its unexpected flowers in our face. The tall meadow-rue and the jewel-weed made a combination of considerable beauty. But the cardinal flower surpassed them all. Ordinarily, too few buds open at once, and consequently the one-sided racemes, in spite of their brilliance of colour, present a ragged and incomplete appearance. But, owing to some magic of soil or sun, my flowers burgeoned out rich and full. Such magnificence of colour, such compactness of bloom, I have never seen. The flowers actually overlapped one another like scales, and the inflorescence was without a break. For whole weeks they stood there like tapers of vermilion flame; and day by day I watched them as, with the advancing bloom, the superb colour crept slowly up the stems, until at length the last glory flickered at the top and died. And all that was left were a number of unsightly stalks on which the seed-cases were already beginning to turn brown.

Of course, I had many disappointments; but these are not so pleasant to dwell upon. Many a specimen transplanted with tender care never came up. Moles beneath the surface, and rabbits above, had to be reckoned with. Once a workman hired to clear out the weeds eradicated a thriving colony of the beautiful though ephemeral day-flower; and occasionally when I returned at night I found that during the day my junior assistant had dug up my most cherished possession.

Nevertheless, in spite of all drawbacks, the making of the wild garden has been a pleasure. Holidays, vacations, and many an hour snatched before and after the business of the day, have been devoted to its care. Woods and meadows and mountains have been explored, and the search after the hiding-places of the rarer flowers has had about it some of the keen enjoyment of the chase. In the three years that it has been a-building quite a deal has been accomplished. From the time the first hepatica opens its eyes until the last gentian shrivels in the frost some eighty species bloom within its narrow boundaries. And most of these have been brought there, in basket



A colony of the native orchid commonly called "rattlesnake plantain" (Goodyera pubescens)

or wheelbarrow, from the country round. The stocking of the garden has furnished an object for every ramble and been the dominant idea in every drive. It has involved manual labour of the most arduous kind, for I had no corps of servants to whom I could say go hither and they went, nor do this and it was done. The garden, such as it is, is the work of my own hands, and the enjoyment I find in it is heightened by the labour it cost. If the making of it has brought me into closer contact with nature, so has it also awakened a wider sympathy with man. One cannot push a loaded wheelbarrow over many miles of unbroken country without getting rid of much of his indifference toward the men who work with their hands. As a recreation it has displaced tennis and the wheel, and even the links hold out their allurements in vain. Recreation, instruction, work: these three are found in my wild garden. What royal game can offer more?

II. California Wild Flowers for American Gardens

By Joseph Burtt Davy

The beauty of many of our California wild flowers and their suitability for garden culture are not as well recognised by the horticulturist and garden-lovers of our own country as by those of other lands. In England, for example, no town or country garden would be considered complete without its "herbaceous border," containing among plants from other lands many of the charming flowers which make the California hills and plains, and even deserts, such a blaze of glory in the months of February, March, and April. Among these old-fashioned favourites is the golden orange Eschscholzia, or California poppy, usually grown in northern Europe as a summer annual. How well I remember the keen delight I took, in my boyhood days, in running out into the garden in the dewy hours of the June mornings to watch the little patches of Eschscholzia, sown by my mother's own hand, throw off their quaint nightcaps and show their rich, satiny petals at the first touch of the sun's rays, and the dainty little "baby blue-eyes," and the prettily spotted *Nemophila maculata*, drooping with the weight of glistening dew-drops, respond with a welcoming smile to the gentle caress of the sun. Other summer annuals from far-off California always graced our flower beds—slender pink clarkia, gorgeous lilac godetia, blue lupine, pink calandrinia, the quaint, pink-and-white collinsia, called by California children "Chinese pagodas"; yellow collomia, dainty, white, pale-yellow or pinkish "meadow foam" (Flœrkia), bright little "birds' eyes" (*Gilia tricolor*), prim tidy-tips (layia), golden bartonia (*Mentzelia Lindleyi*), rich blue California bell-flower (*Phacelia Whitlavia*), and the delicately cream-coloured "cream-cups" (*Platystemon Californicus*).

Wintergreen and Indian pipe

In the shrubbery, also, California is represented among the earliest flowering shrubs of spring by the beautiful pendulous, pink racemes of the flowering currant, with its spicy odour, and the golden-flowered, evergreen mahonia.

I could easily describe a dozen other species which would grace the garden of the most fastidious lover of flowers, provided he is not wedded to the formal bedding-out style of gardening. I may only mention, however, the white forget-me-not (Plagiobothrys), with its fuzzy, warm bud-covering of rich-brown hairs: California children call it the "pop-corn flower," but the more poetic Spanish-Californians euphoniously named it *Nievitas*, the diminutive of *nieve* (snow). This is an annual plant, grown from seed, and, like the gilias, is found on the dry plains and hillsides of middle California. Singly, this plant is not showy, but sown in a mass it is wonderfully effective.

Shooting stars (page 33) are charming spring flowers. There are three or four species in California. The plant is also called "mosquito bills," "wild cyclamen," "mad violets," "prairie-pointers," "pickler-bills," and "roosters' heads," the latter name applied by boys with fighting propensities, who gather two stems, hook the flowers together, and pull to see which head will come off first. The most beautiful species of them all is Cleveland's shooting star (*Dodecatheon Clevelandi*), from southern California, blossoming in the early springtime, even before the baby blue-eyes are awake. It sends up a tall shaft, crowned with a large cluster of beautiful blossoms, varying from a delicate lilac to pure white. The petals are ringed below with pale yellow, and the beak of the flower is a rich prune-purple. There is a generous, fine look about these flowers, although they are exquisitely delicate. Their charm is completed by delicious perfume, like that of the cultivated cyclamen.

Shooting stars are perennial, tuberous-rooted plants, not difficult of cultivation if properly managed. They can be grown in pots, like the cyclamen, and dried off when the seeds mature and the leaves wither. They should then be kept dry until late in the following fall, when they may be gently watered and placed near the light if they are to be flowered in the house, or placed outside in the spring, care being taken not to allow them too much water. They should be protected from mice while dormant.

Dalibarda repens

The beautiful prickly phlox, *Gilia Californica*, is a bushy perennial plant with densely fascicled needle-like leaves and masses of handsome pink or lilac flowers. The texture of the petals "is of the finest silk, with an exquisite sheen," and the blossoms have a delicate fragrance. It grows on dry hills, or on the plains in dry, gravelly washes of torrential streams, in southern California and northward to Monterey. This plant has a peculiar charm for the traveller, because it produces such bright masses of colour among the cacti and boulders of the most desolate "washes," so characteristic of those semi-arid regions with torrential rains, where there is not enough natural verdure to check the rushing off of the waters. And it charms one by its generosity in blooming so late in the summer season, when the hills have exchanged the greenness of their winter costume for the sere brownness of the summer, which is our dormant season, when the roads are thick with dust, and when few other wild flowers are to be seen.

The lemon-lily (not an American plant) along a driveway

The annual and perennial herbs, though the most noticeable, are not the only plants of California which produce beautiful flowers. We have gorgeous masses of pink rhododendron and cream-and-yellow azalea in springy places on mountainsides; the deep magenta chaparral-pea forms dense, tangled, impenetrable thickets of spiny shrubs on the dryer and more exposed ridges of the same mountains, intermixed with the white tresses of the chamisal and the delicate pink or white waxen bells of the manzanita; elsewhere we find the glorious white halos of the Matilija poppy, the stately cream-coloured spikes of the yuccas, and dozens of other ornamental shrubs, too numerous to mention here, which would grace any garden. Our ornamental flowering trees are few, but the creamy trusses of Madroña blossoms, succeeded by bright scarlet berries, and the white candelabras of the California buckeye, are worthy a place in any garden. Among the shrubs, none are greater favourites or more characteristic of California than the blue-tinted ceanothus, or California lilac. It grows on arid, shaly slopes of the mountains near the ocean, where it can catch a whiff of salt-laden air, and seems to reflect some of the blueness of the water in its masses of blossoms. Often it forms the prevailing shrub over areas of hillside many acres in extent, to which it gives a quiet and hazy china-blue tint. California lilac was cultivated in the gardens of the early settlers in San Francisco until replaced by exotics, often much less worthy of a place there; it is now rarely seen in cultivation in the West, though sometimes grown in English gardens. The odour of the flowers is peculiar and not altogether pleasant, but recalls many a joyous California mountain-climb to one who has imbibed a deep love for her solitudes.

CHAPTER XVIII. ROSES

I. Where Shall We Plant Roses?

By L. H. Bailey

THAT depends on what you want them for. If you want them primarily for fine flowers, plant them in an area by themselves, where they can have good care. Roses are highly bred plants. They cannot shift for themselves and yet maintain all their superlative excellences, any more than potatoes or blackberries can. Thrust into the shrubbery, they suffer in the competition. The flowers deteriorate; the bushes dwindle and die. Roses need special treatment and care. They are flower-garden subjects.

If one wants a good mass of shrubbery, he must choose plants that are vigorous, hardy, verdurous, and able in large measure to care for themselves. The common named garden roses do not belong to this class of shrubs. They are not verdurous. Their foliage is scant, not adapted to mass effects, and very liable to insect and fungous attacks. Highly bred roses should not be mixed in the general border.

To all these remarks there are exceptions. Some of the single and wild roses are well adapted to shrubbery masses. This is particularly true of the East Asian *Rosa rugosa* (page 317), which is hardy, has an attractive habit, strong and picturesque canes, abundant and interesting foliage, attractive large white or red single or semi-double flowers, large and conspicuous fruits, and is practically free from insect and fungous attacks. This rose has character as a shrub, winter and summer.

When I say that roses should be planted by themselves, I do not mean that they should be set in the lawn. They are out of place when scattered over the yard. They mean nothing there. One cannot cultivate them. They are unsightly when tied up in straw for the winter. Their period of attractiveness is short. When the bloom is past they are uninteresting. In the lawn, the plants must compete with the grass. They suffer from drought. Being scattered, they receive only occasional attention.

If you are fond of roses, it is a good plan to make a regular rose garden at the side or rear of your place, in the spirit that you would make a strawberry bed. Choose good soil. Till, and fertilise, and prune. Work for a heavy crop—a crop of large and perfect flowers.

There are certain kinds of roses that are well in place on banks and rough borders and against fences and gates. These are usually not the highly developed named sorts, however.

Crimson Rambler is always in place on a porch; one is shown on page 303. The same may be said of the Baltimore Belle and multiflora types, where they are hardy. If there is no space in which roses can be separately grown, the plants may be placed alongside other shrubbery, and late-blooming herbs may be massed about them to supply foliage and to fill the latter part of the season.

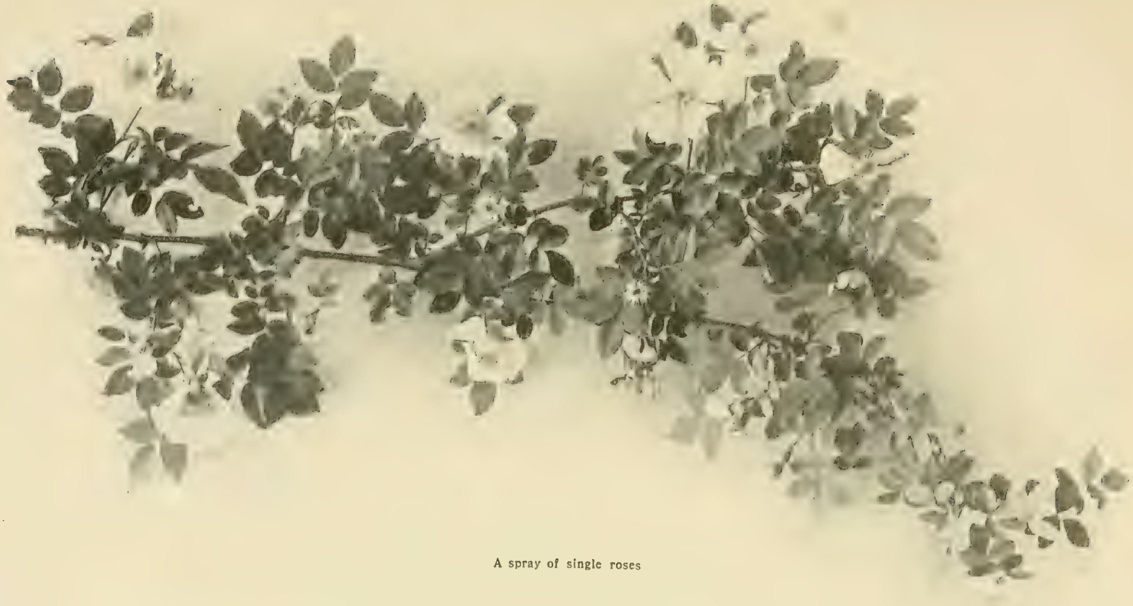
There are two questions to ask when you are discussing the place to grow roses: Are they to be grown primarily for flowers? Are they to form a structural part of the landscape planting?

II. The Modern Tendency in Roses

By Leonard Barron

Notwithstanding the nominal position that the rose has held, from time immemorial, as the "queen of flowers," it is not to be gainsaid that the rose as a garden plant has been relegated of late years to a secondary place. It has been overshadowed by the very laudable desire to plant more largely of native trees and shrubs, with which have been associated the flowering shrubs of Japan. Unfortunately, rose plants are not decorative bushes of themselves—at least, the most commonly accepted groups are not, and in order to devote space to roses a decided rose enthusiasm is first of all needed. A rose plant must be looked upon only as a means to an end—glorious roses—and the more this object is kept in view the less ornamental does the rose plant become. This is due to the hard pruning that is necessary if you would have the best blooms on the hybrid perpetuals, which are the only generally reliable kinds for the average garden.

But there is a change coming over the scene. Since the very wide distribution of the popular Crimson Rambler, attention has been directed to the possibilities of other groups of roses for various purposes. The avail-



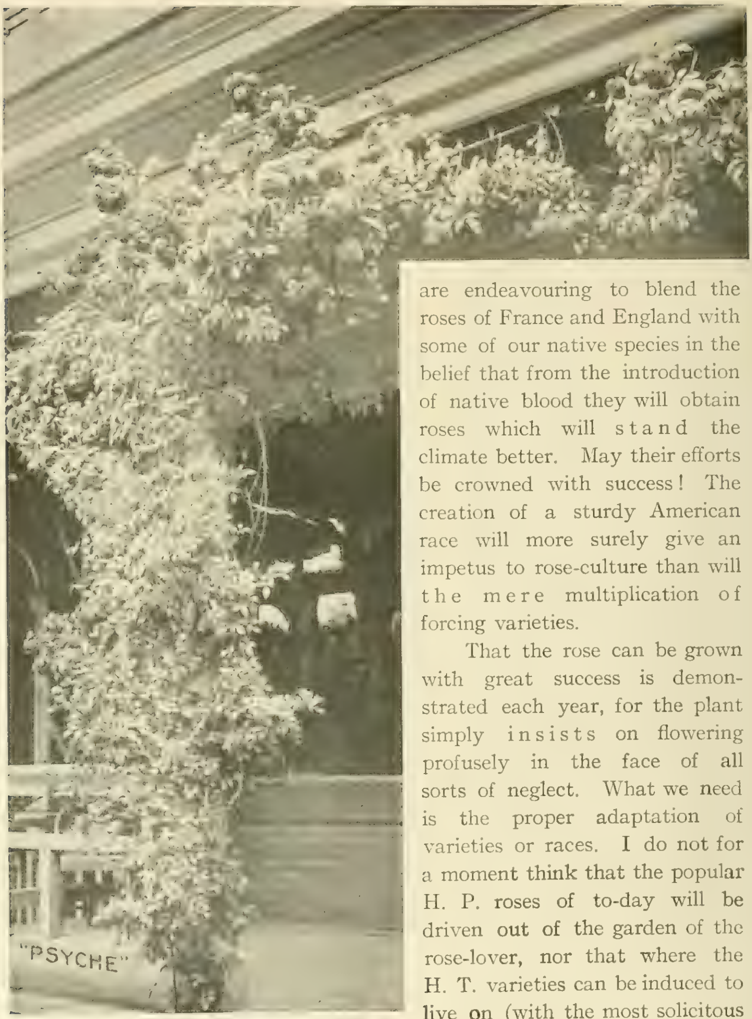
A spray of single roses

ability of climbing roses for garden use has led many into planting this and Wichuraiana, and hybrids from them, in continually increasing numbers. A few progressive horticulturists have seen these things, and there is a very marked tendency now in various parts of the country to raise up a new race of roses which will fit our climatic conditions better than the French races upon which dependence has been placed, and to which the mind naturally turns whenever the rose is named. The strong sun of summer and the severe trials of winter make the conditions for roses in America very different from those that prevail in England and in France, and the roses which have been bred to meet the requirements of those countries do not always find things most comfortable for them here. Yet for a long time to come reliance must be placed upon such varieties of European origin as are found best fitted to survive.

The present trouble with roses in American gardens is that the bloom falls as soon as it is developed, and while we can grow fine wood and get a burst of bloom that is marvellous, yet it is all over in a day or two, and the season of the rose is dead in its birth. Therefore is the present tendency to try other roses for other purposes than the mere blooms.

There are hybridists at work who

Crimson Rambler



Psyche, a climbing rose

are endeavouring to blend the roses of France and England with some of our native species in the belief that from the introduction of native blood they will obtain roses which will stand the climate better. May their efforts be crowned with success! The creation of a sturdy American race will more surely give an impetus to rose-culture than will the mere multiplication of forcing varieties.

That the rose can be grown with great success is demonstrated each year, for the plant simply insists on flowering profusely in the face of all sorts of neglect. What we need is the proper adaptation of varieties or races. I do not for a moment think that the popular H. P. roses of to-day will be driven out of the garden of the rose-lover, nor that where the H. T. varieties can be induced to live on (with the most solicitous

Roses in California

care), that any new races will oust them from our best gardens. No, indeed; for they are the roses of sentiment and of common belief. But in remote parts of the country where a rose is merely a rose, the demand for varieties that will last in flower is great, and when such can be introduced there will be roses everywhere. The rose will never be out of fashion or favour, and, given the right varieties, the demand for it will increase.

A marked feature of hardy rose-growing already referred to is in the production of what may be called the Rambler hybrids—roses that make tremendous growth each year and are suitable for pillar work. Many people want rose-bowers and arbours, to which purpose these hybrids are, of course, well suited. They are hardy, free-flowering, and of rampant growth, and where Wichuraiana has been used in their making, have foliage that is almost evergreen and insect-proof. I look to this class as the basis of a fresh stimulus for rose-growing in our gardens.

III. Outdoor Roses for the South

By P. J. Berckmans

Out of the hundreds of roses described in floral catalogues, it is sometimes exceedingly difficult to select such varieties as are best suited for open-ground growing in the South. The trouble is that a large majority of the varieties of tea-roses are of such weak constitution as to unfit them for the above purposes, and are suitable only for forcing under glass. By the indiscriminate selection of new roses offered with extravagant descriptions, many of our enthusiastic amateur rosarians have met with disappointment. Preference should be given to old favourites which have withstood the test of years and have long been the glory of Southern gardens. Scores of newcomers have of late taken their places, only to disappear with their first season of growing, if, indeed, they grew at all.

Years ago, before the forcing of roses under glass had stimulated production of varieties intended for that purpose, the originators of new sorts looked more to a robust constitution, combined with a profusion of bloom, perfection of shape, and lasting colours, than to the characters that now constitute the up-to-date forcing rose. Forcing roses require the utmost skill and careful regulation of artificial temperature to bring out their wonderful fine points. At the South there are many classes or types of roses which grow to great perfection, but cannot withstand the cold of the Northern winters. There is, therefore, a greater range in selecting varieties for special purposes.

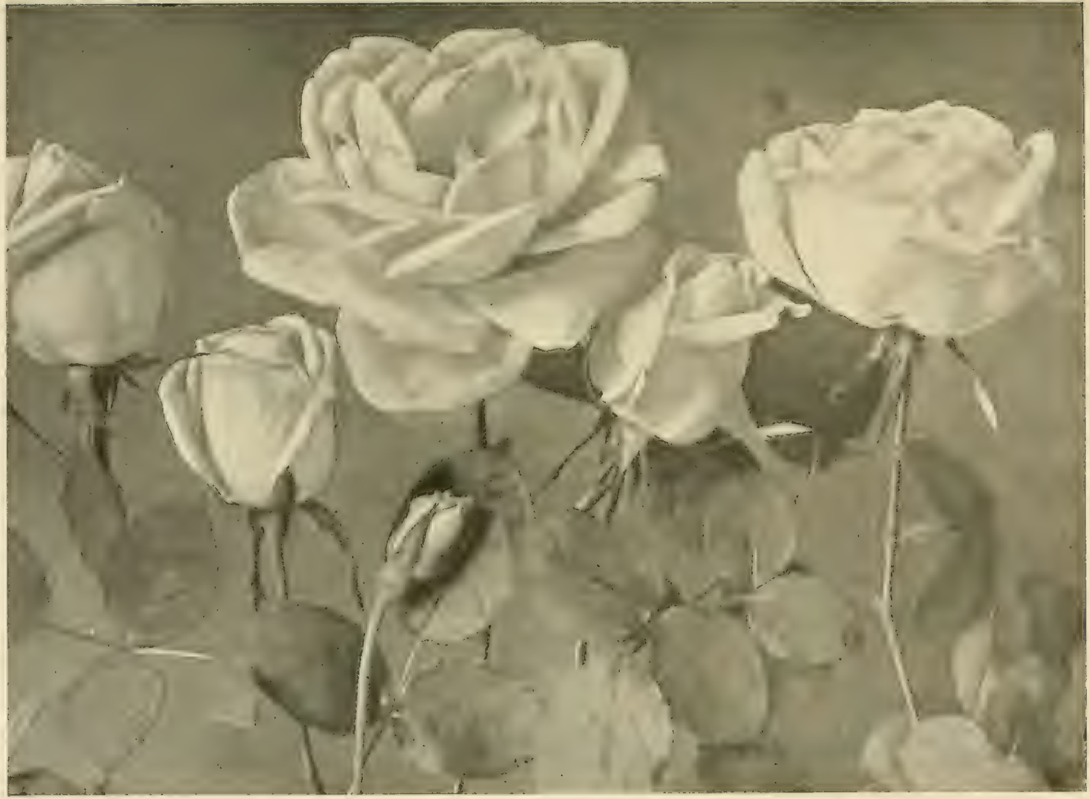
The tea-roses will doubtless long remain the favourite class; but in planting the proper sorts the amateur must not be misled by selecting those whose constitution is too weak to stand the long and warm southern summers. We cannot expect to grow in open ground as perfect Brides, Bridesmaids, Perles, etc., as are grown under glass, but we still have our Gloire de Dijon, Madame Camille, Devoniensis, Maréchal Niel, Souvenir de la Malmaison, Marie Van Houtte, and scores of others that have survived hundreds of newer sorts, and bid fair to survive for many years hence. The climbing Noisette roses frequently grow to enormous size, and are noted for the profusion and length of blooming. In the Hybrid Perpetual class are found the most perfect forms, the short-jointed sorts being as a rule those that bloom during the longest part of the growing season. Among some of these varieties, as also in the Hybrid Tea section which produces the most exquisite flowers, are many which are affected with what is termed "die back," which is often followed by the loss of the plant. Among these are La France, American Beauty, Caroline Testout, and a few others. Polyantha roses give excellent results, and seem to adapt themselves to most soils.

Again, among the newer tea-roses there is a deficiency in their root system which causes a weak constitution. While this defect is less apparent when such plants are grown under glass, it becomes more serious when planted in open ground. Such varieties may, however, receive increased vigour if they are budded upon strong-growing stocks, and after trying many of the species used for that purpose by European growers, the Manetti has been found the most desirable. Many of our best tea and hybrid perpetuals would long since have disappeared from cultivation had it not been for the Manetti stock, which is in extensive use.

As a guide for prospective rose-planters at the South, the following lists are suggested as likely to prove the most successful:

ON OWN ROOTS

Tea—Bon Silene, Bride, Bridesmaid, Caroline Kuster, Comtesse de Breteuil, Christine de Noué, Coquette de Lyon, Duchesse de Brabant, Etoile de Lyon, Kaiserin Augusta Victoria, Maman Cochet, Marie Guillot, Madame



White Lady

Camille, Mme. Abel Chatenay, Francisca Kruger, Mme. Honoré Defresne, Meteor, Vicomtesse de Wautiers, Safrano, Zelia Pradel.

Bourbon—Glory of France, Imperatrice Eugenie, Princess Imperial Victoria, Souvenir de la Malmaison.

Hybrid Perpetuals—A. K. Williams, Anne de Diesbach, Eugene Furst, Earl of Dufferin, Alfred Colomb, Coquette des Alpes, General Jacqueminot, Gloire Lyonnaise, Jean Liabaud, Mme. Moreau, Mme. Gabriel Luizet, Magna Charta, Paul Neyron, Pierre Notting, Pæonia, General Washington, Perle des Blanches, Prince Camille de Rohan, Rev. J. B. M. Camm, Ornement des Jardins.

China—Archiduc Charles, Madame Carl, Mme. Jean Sisley.

Polyantha—Cecile Brunner, Clothilde Soupert, Marie Favié, Perle d'Or, Mozella, Climbing Clothilde Soupert.

Noisette and Climbing—Devoniensis, Elie Beauvilain, Reine Marie Henriette, Reve d'Or, Solfaterre, Lamarque.

BUDDED UPON MANETTI

Banksia—White and Yellow.

Tea and Hybrid Tea and Noisettes—Captain Christy, La France, Caroline Testout, Perle des Jardins, Angelique Veyisset, Chromatella, Maréchal Niel, Niphetos, Emily Dupuy, Madame de Watteville.

Hybrid Perpetuals—American Beauty, Baronne de Rothschild, Doctor Hénon, Frère Marie Pierre, François Michelon, Mabel Morrison.

IV. Hardy Roses Near Chicago

By W. C. Egan

The vicinity of Chicago, especially that of the bluff lands to the north and lying close to the lake, is not an ideal home for roses, but with a proper selection of varieties and a suitable winter protection they may be grown quite successfully. The following so-called hybrid perpetuals have proved the most reliable with me:

Carmine, Crimson and Red—Prince Camille de Rohan, General Jacqueminot, La Rosiere, Captain Hayward, Anne de Diesbach, Alfred Colomb, Countess of Oxford, Ulrich Brunner, Marshall P. Wilder, Louis Van Houtte, Mme. Victor Verdier, Pierre Notting, Eugene Furst, Pæonia.

Pink and Rose—Magna Charta, Mrs. R. G. Sharman-Crawford, Captain Christy, Garden Favourite, Paul Neyron, John Hopper, Baronne Prevost, Prince of Wales, Lyonnaise, Mlle. Suzanna de Rodocanachi.

White and Blush—Mrs. Paul, Perle des Blanches, Madame Plantier, Hybrid China.

The following additional ones are quoted as doing well on the "Wooded Island" at Jackson Park, Chicago, where the elevation above the lake is some eighty feet lower than here at Egandale: Duchess de Morny, Caroline de Arden, Bell Normandie, Comtesse de Serenye, La France, G. M. Maurande, Baroness Rothschild, Earl of Dufferin, Jean Liabaud.

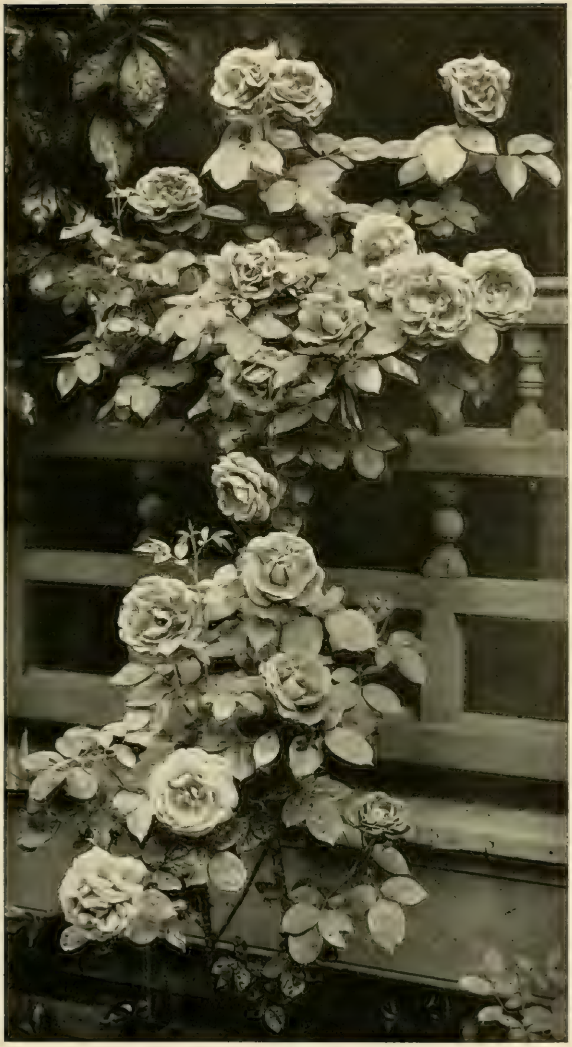
Rosa Spinosissima var. Altaica

I cannot handle La France, for the buds brown in the sun, nor Mrs. John Laing, which, with Jeannie Dickinson, is tender at Jackson Park.

Nearly all of the moss-roses do fairly well here, including the new remontant forms. Hermosa, Clothilde Soupert, and many of the so-called dwarf fairy roses, especially the exquisite Mlle. Cecile Brunner, come through the winter well when protected, and bloom all summer. About all of the hybrid tea bedding roses require removal to a coldframe in the fall, or a sash and frame placed over them for the winter.

The hardiest climbing garden rose is the Prairie Queen, but it blooms much better if slightly protected from the sun's rays during the winter. The following climbing roses have proved valuable under winter protection: Crimson Rambler, Seven Sisters, Dundee Rambler, the Dawson, Thalia, Euphrosyne, Paul's Carmine Pillar, Reine Henriette Marie, and Wichuraiana and its hybrids.

Nearly all of the hybrids of *R. rugosa* are hardy without protection, the lovely Mrs. Bruant, with its tea blood, being an exception. Jackson Dawson's hybrid rugosas, "The Arnold" and "W. C. Egan," have done exceptionally well. Lord Penzance's hybrid sweetbriers require protection, and some even then go back. A set that I have growing against a north



A good pillar rose. Climbing General Jacqueminot

wall, protected in winter by a single thickness of burlap, does the best. The Harrison and Persian Yellow do fairly well without protection. The following thrive unprotected: *R. rugosa*, *R. mollis*, var. *pomifera*, *R. spinosissima*, var. *Altaica* (a lovely single white, resembling the Cherokee rose), *R. nitida*, var. *alba*, *R. rubrifolia* (*R. ferruginea*), and the sweetbriers.

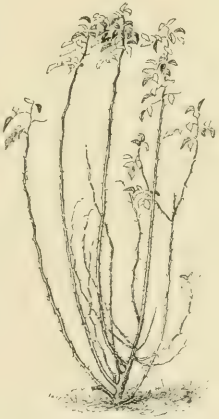
The following are well adapted to wild gardening, and are native to this section: *R. setigera*, *R. Engelmanni*, *R. blanda*, *R. Carolina*, and *R. humilis*.

V. PRUNING ROSES

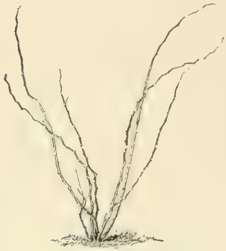
BY B. M. WATSON

In Bailey's "Cyclopedia of American Horticulture" some fifty species of roses are enumerated as common in cultivation. From these species innumerable varieties have sprung. It seems impossible, in a genus so diversified, to give any general rules for pruning, but by classifying roses by their habits of growth it is hoped that some help may be given the inexperienced grower. It is assumed in what follows that the plants are well cultivated and have plenty of nourishment.

1. Hybrid perpetuals, hybrid teas, Provence and moss roses are best grown as bushy plants. They should be severely cut back while dormant in spring, but never in summer or early autumn, as is sometimes done because they are straggling and look unkempt in an otherwise neat garden. From two-thirds to four-fifths of last year's wood, and all weak shoots, are removed. This results in strong growths, producing large flowers, the size of which can be increased by disbudding. If numerous smaller flowers are desired—*i. e.*, quantity at the expense of quality—the shortening-in need not be carried so far. It is permissible to cut back only one-half, but this treatment is objectionable, and does not tend to keep the plants in good condition. This winter pruning should be supplemented by a summer pruning, which consists of simply cutting out the flowering shoots after the flowers fade.


Hybrid perpetual rose before pruning. (General Jacqueminot)

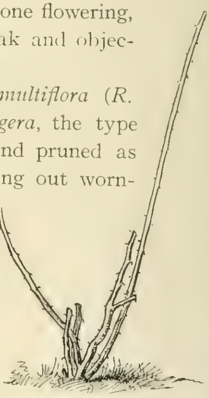
It is already done if all the blooms have been gathered. Remove weak growths and all sprouts from the stock as they appear. As the plants age, worn-out stems must be taken out and the center left open to encourage new shoots. Some of these roses are short-lived and must eventually be replaced. Hybrid perpetual roses of weak habit —*e. g.*, Prince Camille de Rohan—should be cut back harder than vigorous growers like General Jacqueminot, but only when in good health. Hybrid teas as a rule require the most severe pruning; moss and Provence roses least.


Crimson Rambler before pruning

2. Climbing roses—the Dawson, Baltimore Belle, Prairie Queen, Crimson Ramblers, and others—need not be pruned so hard as those above described. Cut off in spring, before the buds open, from one-fifth to one-third of the previous year's growth; also, in established plants, any of the old, flowering wood which is enfeebled. Do not hesitate, even if a part of the trellis is laid bare. It is by this means only that these plants can be kept vigorous. In summer take out most of the old wood after it is done flowering, and train new growths as desired, pinching out weak and objectionable shoots.

Half-climbing roses, like the Japanese *Rosa multiflora* (*R. polyantha*) and its varieties, the sweetbriers, *R. setigera*, the type and the dog rose, are commonly grown as bushes and pruned as above described, more attention being paid to cutting out worn-out stems and keeping the centers open; but the flowering wood must not be removed after blooming where fruit is desired in winter.

Trailing roses (*R. Wichuraiana* and its varieties) require comparatively little pruning, particularly in the North, where unfavourable seasons are apt to kill some of the wood. By taking out dead branches and cutting back enough to restore the balance opportunity is given for new growths which are essential to keep them in good condition. Half-climbing hybrids of this rose—*e. g.*, Mr. Walsh's Sweetheart, Debutante, etc., and the old Ayrshire roses—*R. arvensis* (*R. repens*) and their varieties—are pruned in much the same way.


Crimson Rambler pruned (scale somewhat larger)

Rosa rugosa, one of the best roses for the shrubbery

The Persian Yellow rose, Harrison's Yellow, and Austrian Brier are not strong growers. One must be cautious with the knife, cutting out the flowering wood after the blooms fade. In established plants the worn-out stems can be removed at any time. Scotch roses can be treated in the same way, and are much benefited by being cut clean to the ground once in about seven years. Their habit of spreading by underground stems helps the recovery.

3. Wild roses, *R. blanda*, *Carolina*, *lucida*, *nitida*, etc., are grown not only for the flowers, but for bright twigs and hips, in winter. Consequently much depends upon sturdy growth. They are frequently planted in such quantity that careful pruning is impossible. Take out the older wood from time to time, and at intervals of several years, determined by their condition, cut clean to the ground, at the same time giving manure and stirring the soil. An equally good method of renewal is to dig up and reset the plants, discarding the old and feeble.

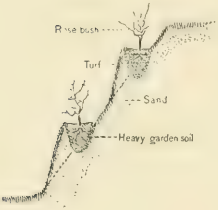
Rosa rugosa and its variety alba do not require annual pruning, unless it be a little shortening-in of the tips—an interminable operation. After these plants are well established, however, the older canes should be cut out occasionally, thus keeping the center free and encouraging new growths. If at any time they are in bad shape from winter-killing or disease, they can be cut to the ground. Hybrids of *Rosa rugosa*, like Madame Bruant, are helped by spring pruning, cutting back the annual growths, and thinning out old wood.

4. Tender roses, like the teas, Chinas, Bengals, and Bourbons, should be cut in at the beginning of the flowering season, and, since they are really perpetual bloomers, this process must be continued as long as the season lasts. Weak and unproductive shoots must be removed. Cloth of Gold, Lamarque, Maréchal Niel, and other roses of like habit, are closely pruned after their wood is well ripened, when they are most at rest. Under glass, this is usually done just before starting them into growth. To bloom the Cherokee rose in a cool greenhouse in January and February, four-fifths of the summer's growth must be cut away in October. Worn-out canes can be removed at any time. The double-flowered varieties of *R. Banksiæ* are severely cut back after the blooms have faded, in May or June, in a cool house.

Many methods are employed in propagating roses, but the practice here described is simple and effective. Cuttings can be rooted in the garden or in the greenhouse. For out-of-door work they should be made in November, before severe frost, of wood of the current year's growth. They should be cut into lengths of six inches, tied into bundles with tarred rope, and buried eighteen inches deep in sandy soil, and furthermore protected from freezing by a covering of leaves. In spring, when the ground is thawed and settled, they should be planted in V-shaped trenches in well-prepared beds, using a little rotted barnyard manure. The cuttings should stand nearly erect, and be so deeply planted that only one bud shows above the surface of the ground, two inches apart in the row, with the rows twelve inches apart. In this way many desirable hardy roses can be multiplied—*e. g.*, Crimson and Yellow Ramblers, the Dawson Rose, *Rosa multiflora*, *R. Wichuraiana*, and all their other progeny, *R. setigera*, Prairie Queen, and Baltimore Belle, etc., also the Manetti rose for stock. Under glass, these same varieties will give a larger percentage of rooted plants if the cuttings are made two or three inches long, planted in pure sand in pots or boxes, and kept in a greenhouse, 45° F. These cuttings, also, should be made in autumn, before severe weather, of wood just completing its growth. They should be planted thickly, about one-half their length deep, and well shaded for three weeks. Keep the temperature so low that the buds will not start into growth before the cutting is rooted. The young plants can be set out in May, either directly from the cutting-bed or after having been established in pots.

VI. A Rose Bank

By W. H. Sargent



Concealing an unsightly bank by transforming it into a rose garden accomplishes several desirable objects. It "makes the waste places to blossom as the rose," and also affords the plants abundant light, air, and room, which they do not always get if planted in beds where room is of more value.

Pockets should be dug into the side of the bank and the turf brought forward and shaped into basins, as shown in the sketch. In this way all the wash from the bank will be collected around the roots. Climbing roses do particularly well if kept a little off the ground. In the North, where the winters are particularly severe, the bushes should be pinned back against the bank and covered with brush or leaves.

CHAPTER XIX. HOW I BUILT MY COUNTRY HOME

A Concrete Example of Landscape Gardening

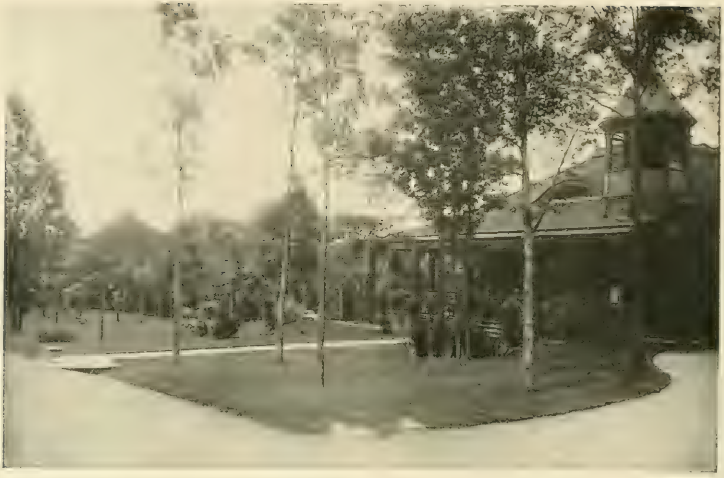
By W. C. Egan

I AM garden-bred, for in the early fifties my father's garden was one of the show-places in Chicago; but I have no recollection of a fondness for gardening during my youth. A strenuous business life of more than thirty-five years in that bustling city so impaired my health that my physician prescribed a retirement and enjoined a life in the open air. Being happily anchored by a growing family, a roving, open-air life was out of the question. How was I to occupy my mind, hitherto in constant activity, and still remain in one place? I did not have to consider long. The subtle influence of the garden of my youth—so long dormant—asserted itself, and an ever-increasing love for shrub and flower and arboreal life seemed to say to me: "Why not build and maintain a country home—one of your own creation—exhibiting your own individuality? Why not make it *your* garden, not a gardener's garden?"

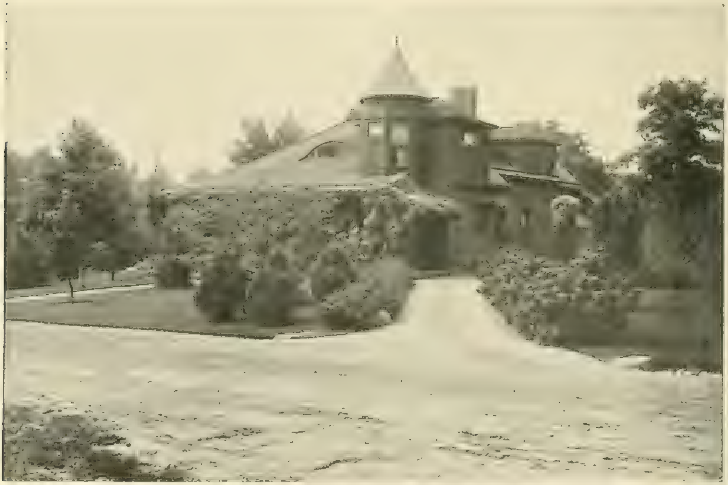
The die was cast and a hunt for the site began. The towering bluffs and wooded ravines bordering Lake Michigan north of Chicago afforded abundant opportunities for selection, and a view of the lake over the wavering foliage of the ravine tree-tops caused the selection of a site for the future "Egandale." The natural beauties of the site were further enhanced by a wooded ravine constituting two-thirds of the boundary lines, whose trees afford a massive bank of foliage which is ever refreshing to the eye.

All this happened fifteen years ago. I had the place, but no knowledge of how to develop it. Flowers, shrubs and trees did not grow among my business affairs. Nevertheless, I was determined that the place should be of my own creation, and so I resolved to go ahead and make my own mistakes in my own way. And I made three important ones.

A dense undergrowth confronted me. The woodman had discovered my prize years prior and had appropriated every tree on the main land large enough to convert into cord-wood. Of ancestral trees there were



The house as it looked in 1891. Note the useless trees in the front yard and the awkward curve in the driveway



The house in 1900, showing improvement in front lawn by the massing of shrubbery none; but my knowledge of them, being confined to hearsay, caused me to imagine every long-shanked oak that grew from a decapitated stump capable of being converted into one. I considered that a plethora of ancestral oaks would be the crowning glory of a lawn, so I left any towering tree that possessed a head.

My next mistake was in road-making. In laying out my entrance roadway I substituted an uncouth curve for a graceful one to save a worthless oak that happily died about the time I discovered my error.

In the third place, I wanted a rockery, and wanted it where all could see it; so I placed it near the center of the lawn. Men, teams and a derrick were engaged, and soon boulders, gathered nearby, were piled up, one upon another, and a circular rim eight feet in diameter and six feet high was erected and filled with soil. It was fearfully and wonderfully made, and looked it—not then, however, for I thought it a thing of beauty that would last forever. I grew flowers on top, but neglected to furnish a step-ladder that they might be seen.

I soon grew tired of the stork-like trees, that seemed to make no headway, and they were grubbed out. I bought exotics from nurserymen and planted them here and there until my lawn was littered up worse than ever. My man got dizzy dodging them with the lawnmower. I was not satisfied. Something seemed wrong. The place had an unfinished look. I was regaining my health, had open-air exercise, but there was a screw loose somewhere.

What little reading I had done in the horticultural line had educated me faster than I had improved the place. Fortunately I came across a copy of the *American Garden*, edited in those days by a certain professor now at Cornell University. In a leading article on landscape gardening, this man advocated an open center and massing at the boundaries. Here was an inkling of the cause of my dissatisfaction. I had not opened or massed anywhere. I had cluttered.

When spring came there was an upheaval. The lawn was opened up and plantings made in groups at the sides. My lawn seemed to have doubled in size. Heretofore the mind was confused when looking down the grounds. Now there was a peaceful quietness as the eye glanced along the unbroken greensward to the bordering mass of leafy trees.

The rockery had become a scarecrow. Even the wild geese in their migratory flights steered to the right or left of it. I took a lot of pleasure in demolishing it. A spur of the ravine ran into the lawn a hundred feet or so, dividing the southern end into two deep bays. I reasoned that the same forces that made the spur might have deposited some rocks at its head; and I recalled an outcrop I had seen on the side of a hill in California, where Nature supplied the rocks and the birds the plants. So I placed some rocks in this spot and endeavoured to imitate it.

Up to this point I had practically lost four years of precious time. But now a new era began. The experience, however, had been worth a great deal. It enabled me to warn my friends against the errors with which I had struggled.

In my later plantings I had combined the hardy perennials with the shrubs, planting the former in masses, and not repeating the same perennial at any one point of view. Each shrubbery bed is so planted that some part of it is in bloom from early spring until frost.

The wooded ravines have been left to Nature's care. Wandering up and down the bank is prohibited except where walks are provided, as the

Side yard in 1902, looking toward the house denizens of the wood resent too much familiarity. I found ferns, trilliums, hepaticas or a few moccasin flowers in my own woods, and more from the neighbouring ravines have been added, until groups and colonies abound.

A view of the lake caused the selection of the site

These native plants thrill the heart with delight when spring's first breath rouses them to activity.

Along the shrubbery bank bordering the roadway to the stable, masses of squills, snow-drops, crocuses, chionodoxas, grape hyacinths, and narcissi herald a season of delight, while above them follow, in bloom, the shad-bush, the May-Day tree, and flowering plums and cherries, and the Missouri currant mingles its spicy breath with the scent of the freshly turned soil, just aroused from its frozen slumber. All these are but the advance-guard of a countless throng of hardy flowers that will open up in well-regulated succession, until the stately *Anemone Japonica* comes to fight its battle with Jack Frost.

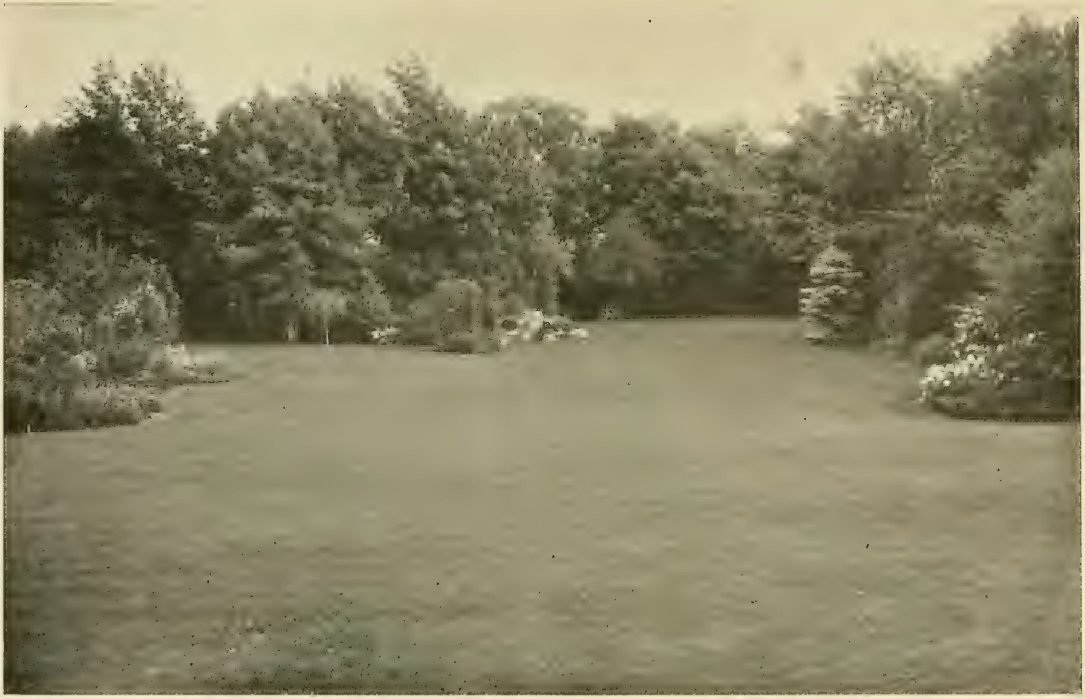
My garden is open to all who will love and appreciate its contents, be they from the mansion in the park or from the cottager's home. My flowers bloom not for me alone, but for those of kindred tastes, and it is a pleasure for me to show them. Many delightful friends have thus been made.

The pleasures of gardening are infinite and varied. One need not delve in the mysteries of botanical lore in order to obtain enjoyment in one's intimacy with plant life. It is best to look upon plants as garden friends. The hardy forms become in time old-established companions, for each spring they arise from their slumber and greet you with renewed life. They are like some dear friends returned from a distant journey, whose presence we have missed.

Not the least of garden pleasures is the exchange of surplus plants with those of kindred tastes. I have many such cherished plants, some of which are from friends whom I have never seen. They are pleasant reminders of their donors, and, under more constant observation than a photograph hidden in an album, they fade not, neither do their gowns go out of fashion.

The side yard in 1890. Worthless trees scattered here and there. No view

It will pay the intending planter to give careful attention to companion cropping with ornamental subjects, so that there will be a successful effect on the same area, or that the defects of one plant may be remedied or covered by the excellences of another. Such a case is pictured on page 30. Here are *Lilium superbum* and peonies. The peony is the earlier riser, starting sooner into growth, and maturing its flowers before the lily has shot its blooming spike above the surrounding foliage. The lily is thus unseen at this time, and takes no part in the floral display, but soon after the withered peony blooms



The same side yard ten years later, showing how a picture was made by cutting out trees that were in the way

have been cleared away the tall lily spikes emerge from the mass of dark-green foliage, and, rising high above it, form their candelabra heads of coral-tinted bells. There is economy in this method, as two crops of bloom, each differing entirely from the other, are produced from one bed. An allied lily, *L. Canadense*, found on the drier parts of the meadow, is another that takes most kindly to garden life. I use it also as a second-crop flower, and to give height and variety to the border.

I grow the American cowslip, or shooting star, which loses its foliage soon after blooming in the spring. Alternating with the plants are *Campanula Carpatica*, whose spreading foliage carpets the ground left bare by the disappearing dodecatheons. Here and there in among both these plants are placed the Canadian lilies, producing a pleasing combination. Both of these lilies may be gathered from our prairies when in bloom, cutting their stalks back to within a foot of the ground, and keeping the bulbs damp while exposed, planting them where wanted at once or in temporary quarters until the fall months.

There are many beautiful flowering bulbs and plants that we should all grow whose foliage ripens off and disappears soon after blooming. They are generally of a character requiring planting in masses to be effective, and are early to flower and vanish, leaving generous spaces of vacant ground until the next spring, adorned only by a monument in the shape of the identifying label. This label is essential in large plantings, for without it the presence of dormant bulbs might be overlooked and damage done in careless digging. How to cover these bare spaces is a matter of importance to those who desire their borders to look neat and tidy. I plant snowdrops, chionodoxas, scillas, crocus, grape hyacinths, and all of the spring-blooming class, in masses under widespreading shrubs, so situated that the sun will reach them during part of the day.

My physician's prescription should be incorporated in the *materia medica* of all nations. It was extremely pleasant to take, and not only restored my shattered health, but was the means of awakening in me a love for the greatest of all delights—one's own garden.

APPENDIX I

FLOWERS FOR SPECIAL PURPOSES

Suggestive lists based upon the colour and season of bloom; the height of the plant; the kind of soil, whether light or heavy, moist or dry; the conditions of shade or sunshine; resistance to frost, and value for cut flowers and for maintaining an uninterrupted succession of bloom.

By M. G. KAINS

EDITORIAL NOTE.—The following lists are believed to be fundamentally different from all other lists of similar appearance. The great fault with the extended lists found in some expensive works on gardening is that they contain too few lists and too many plants in each list. Moreover, the Latin names are often put first or used to the exclusion of the common names. The result is that such lists appal the beginner and are never used. Those which follow are designed to be of every-day practical service to beginner and expert. The writer has resolutely turned his back upon the impossible idea of absolute completeness, which has made the old lists so repellant and unpractical. The keynote of the present endeavour is *suggestiveness*. Hence there are many lists and few plants in each list. This must be the right principle. Surely, the average person does not need fifty or a hundred plants for some one special purpose. Four may be enough; six should be ample; ten names will give plenty of choice.

The net result of the old-time extensive list is to impress the beginner with the immense number of plants in cultivation. But such an idea is worse than useless, because it discourages the beginner. According to the "Cyclopedia of American Horticulture," there are nearly twenty-five thousand species of plants cultivated in America. But what is the use of laying emphasis on a mere cyclopedic fact of such a character? There is another idea which is much more important, *viz.*, the great diversity of human needs and purposes which are comprised under the one word "floriculture." Here are two hundred lists of plants, and each list represents a distinct idea. There are at least two hundred distinct purposes for which people cultivate plants. The differentiation of these purposes must have its educational value. It is to be hoped that the following lists will help the amateur gardener to clear up his ideas and determine what he really wants. The author has a wide acquaintance with plants, and there are very few in the following lists with which he is not personally acquainted. A good many duplicates will be found—*e.g.*, the pansy appears in several lists, but this is part of the original plan, for the best plants are relatively few in number, and it is better to suggest common and easily grown ones for the various purposes to which they are adapted than rare and costly plants of doubtful suitability.

SPECIAL NOTICE

Dates of blooming are based upon the vicinity of New York. The names have been standardised with the "Cyclopedia of American Horticulture."

APPENDIX I

ANNUALS (See Chapter I)

- Ten of the most popular annuals:
  - Balsam, *Impatiens Balsamina.*
  - China Aster, *Callistephus hortensis.*
  - Marigold, *Tagetes* spp.
  - Mignonette, *Reseda* spp.
  - Morning-glory, *Ipomœa purpurea.*
  - Nasturtium, *Tropæolum* spp.
  - Pansy, *Viola tricolor.*
  - Petunia, spp.
  - Poppy, *Papaver* spp.
  - Verbena, *Verbena* spp.
- Ten annuals useful as cut flowers:
  - Alyssum, Sweet, *Alyssum maritimum.*
  - Aster, *Callistephus hortensis.*
  - Baby's Breath, *Gypsophila elegans.*
  - *Coreopsis* spp.
  - Cosmos, *Cosmos* spp.
  - Daisy, Swan River, *Brachycome iberidifolia*
  - Nasturtium, *Tropæolum* spp.
  - Pansy, *Viola tricolor.*
  - Pea, Sweet, *Lathyrus odoratus.*
  - Stock, Ten Weeks, *Matthiola incana,* var. *annua.*
- Six fragrant-flowered annuals:
  - Alyssum, Sweet, *Alyssum maritimum.*
  - Bartonia, *Mentzelia Lindleyi.*
  - Mignonette, *Reseda* spp.
  - Pea, Sweet, *Lathyrus odoratus.*
  - Stock, Ten Weeks, *Matthiola incana,* var. *annua.*
  - Sultan, Sweet, *Centaurea moschata.*
- Six everlasting-flowered annuals:
  - *Catananche cœrulea.*
  - *Gomphrena globosa.*
  - *Helichrysum bracteatum.*
  - *Helipterum roseum.*
  - *Polypteris Hookeriana.*
  - *Xeranthemum annuum.*
- Six annuals that bloom for eight weeks or longer:
  - Ageratum, *Ageratum conyzoides*
  - Clarkia, *Clarkia elegans.*
  - Morning-glory, *Ipomœa purpurea.*
  - Nasturtium, *Tropæolum* spp.
  - Petunia, *Petunia* spp.
  - Zinnia, *Zinnia* spp.
- Six climbing annuals:
  - Balloon-vine, *Cardiospermum Halicacabum*
  - Bean, Hyacinth, *Dolichos Lablab.*
  - Cypress-vine, *Ipomœa Quamoclit.*
  - Hop, Japanese, *Humulus Japonicus,* var *variegatus.*
- Climbing Annuals—*Continued*
  - Moonflower, *Ipomœa Bona-nox.*
  - Morning-glory, *Ipomœa purpurea.*
- Six annuals with striking foliage:
  - Castor-bean, *Ricinus communis.*
  - Corn, Japanese variegated, *Zea Mays,* var *Japonicus.*
  - Hemp, Giant, *Cannabis sativa,* var. *gigantea.*
  - Hop, Japanese, *Humulus Japonicus,* var. *variegatus.*
  - *Nicotiana alata.*
  - Prince's-father, *Amaranetus hypochondriacus.*
- Six annuals that re-sow themselves—likely to prove troublesome:
  - Hop, Japanese, *Humulus Japonicus,* var. *variegatus.*
  - Morning-glory, *Ipomœa purpurea.*
  - *Nicotiana alata.*
  - Poppy, *Papaver* spp.
  - Rose Moss, *Portulacca grandiflora.*
  - Shell-flower, *Moluccella lævis.*
- Six annuals for successional sowing:
  - Alyssum, Sweet, *Alyssum maritimum*
  - Baby's Breath, *Gypsophila elegans.*
  - Clarkia, *Clarkia elegans.*
  - Pea, Sweet, *Lathyrus odoratus.*
  - Poppy, California, *Eschscholzia Californica.*
  - Stock, Ten Weeks, *Matthiola incana,* var. *annua.*
- Six annuals for sunny places:
  - Amaranths, *Amarantus* spp.
  - Balsam, *Impatiens Balsamina.*
  - Bean, Hyacinth, *Dolichos Lablab.*
  - Gaillardia, *Gaillardia* spp.
  - Nasturtium, *Tropæolum* spp.
  - Rose Moss, *Portulacca grandiflora.*
- Six annuals for shady places:
  - Godetia, *Œnothera* spp.
  - Musk-plant, *Mimulus moschatus.*
  - Nemophila, *Nemophila* spp.
  - Pansy, *Viola tricolor.*
  - Tarweed, *Madia elegans.*
  - Torenia, *Torenia* spp.
- Six annuals for rocky places:
  - Baby's Breath, *Gypsophila elegans.*
  - Candytuft, *Iberis* spp.
  - Catchfly, *Silene* spp.
  - Clarkia, *Clarkia elegans.*
  - Nasturtium, *Tropæolum* spp.
  - Rose Moss, *Portulacca grandiflora.*
- Six annuals for sandy soil:
  - Clarkia, *Clarkia elegans.*

Annuals for sandy soil—*Continued*
Cobæa scandens.
Godetia, *Œnothera* spp.
Nasturtium, *Tropæolum* spp.
Portulacca, *Portulacca grandiflora.*
Zinnia, *Zinnia elegans.*

Six annuals for heavy soil:
Alyssum, Sweet, *Alyssum maritimum.*
Chrysanthemum, *Chrysanthemum coronaria*, etc.
Godetia, *Œnothera* spp.
Pea, Sweet, *Lathyrus odoratus.*
Petunia, *Petunia* spp.
Zinnia, *Zinnia elegans.*

Six annuals for very cold climates:
Alyssum, Sweet, *Alyssum maritimum.*
Clarkia elegans.
Marigold, *Tagetes* spp.
Pansy, *Viola tricolor.*
Pea, Sweet, *Lathyrus odoratus.*
Stock, Ten Weeks, *Matthiola incana*, var. *annua.*

Six annuals for warm climates:
Amaranths, *Amarantus* spp.
Balsam, *Impatiens Balsamina.*
Moonflower, *Ipomæa Bona-nox.*
Morning-glory, *Ipomæa purpurea.*
Nasturtium, *Tropæolum* spp.
Rose Moss, *Portulacca grandiflora.*

Six annuals that resist drought:
Bean, Hyacinth, *Dolichos Lablab.*
Ice-plant, *Mesembryanthemum crystallinum.*
Nasturtium, *Tropæolum* spp.
Petunia, *Petunia* spp.
Rose Moss, *Portulacca grandiflora.*
Zinnia, *Zinnia elegans.*

Six annuals that blossom after a frost:
Alyssum, Sweet, *Alyssum maritimum.*
Candytuft, *Iberis* spp.
Clarkia elegans.
Marigold, *Tagetes* spp.
Phlox Drummondii.
Stock, Ten Weeks, *Matthiola incana*, var. *annua.*

Six annuals which may be sown in autumn for early spring bloom:
Candytuft, *Iberis* spp.
Clarkia elegans.
Gilia, *Œnothera* spp.
Pea, Sweet, *Lathyrus odoratus.*
Phlox Drummondii.
Poppy, California, *Eschscholzia Californica.*

Six annuals that blossom in May:
Alyssum, Sweet, *Alyssum maritimum.*
Baby's Breath, *Gypsophila elegans.*
Godetia, *Œnothera* spp.
Marigold, *Tagetes* spp.
Phlox Drummondii.
Stock, Ten Weeks, *Matthiola incana*, var. *annua.*

Six annuals that bloom in June:
Amaranths, *Amarantus* spp.
Candytuft, *Iberis* spp.
Clarkia elegans.
Morning-glory, *Ipomæa purpurea.*
Nasturtium, *Tropæolum* spp.
Stock, Ten Weeks, *Matthiola incana*, var. *annua.*

Six annuals that bloom in July:
Bean, Hyacinth, *Dolichos Lablab.*
Chrysanthemum coronarium, etc.
Cobæa scandens.
Gaillardia, *Gaillardia* spp.
Moonflower, *Ipomæa Bona-nox.*
Nasturtium, *Tropæolum* spp.

Six annuals that bloom in August:
Bean, Castor, *Ricinus communis.*
Chrysanthemum coronarium, etc.
Hemp, Giant, *Cannabis sativa*, var. *gigantea.*
Hop, Japanese, *Humulus Japonicus*, var. *variegatus*
Moonflower, *Ipomæa Bona-nox.*
Maurandia Barclaiana, etc.

Six annuals that bloom in September:
Ageratum, *Ageratum conyzoides.*
Candytuft, *Iberis* spp.
Cosmos, *Cosmos* spp.
Musk-plant, *Mimulus moschatus.*
Verbena, *Verbena* spp.
Zinnia, *Zinnia elegans.*

Six annuals that blossom in October:
Alyssum, Sweet, *Alyssum maritimum.*
Candytuft, *Iberis* spp.
Clarkia, *Clarkia elegans.*
Godetia, *Œnothera* spp.
Marigold, *Tagetes* spp.
Stock, Ten Weeks, *Matthiola incana*, var. *annua.*

Six white-flowered annuals:
Baby's Breath, *Gypsophila elegans.*
Candytuft, *Iberis* spp.
Daisy, Swan River, *Brachycome iberidifolia.*
Helipterum corymbiflorum.
Moonflower, *Ipomæa Bona-nox.*
Nicotiana alata.

Six lilac, magenta, or purple-flowered annuals:
Bean, Hyacinth, *Dolichos Lablab.*
Cobæa scandens.
Mourning-bride, *Scabiosa* spp.
Nemophila, *Nemophila* spp.
Verbena, *Verbena* spp.
Xeranthemum annuum.

Six blue-flowered annuals:
Ageratum, *Ageratum conyzoides.*
Corn-flower, *Centaurea Cyanus.*
Daisy, Swan River, *Brachycome iberidifolia.*
Lobelia Erinus.
Nemophila, *Nemophila* spp.
Salpiglossis sinuata.

Six yellow-flowered annuals:
Calceolaria spp.
Helipterum Sanfordii.
Marigold, *Tagetes* spp.

Yellow-flowered annuals—*Continued*
Nasturtium, *Tropæolum* spp.
Poppy, California, *Eschscholzia Californica.*
Zinnia, spp.

Six pink-flowered annuals:
Amaranth, Globe, *Goniphrena globosa.*
Balsam, *Impatiens Balsamina.*
Clarkia elegans.
Cosmos spp.
Gilia, *Œnothera* spp.
Pea, Sweet, *Lathyrus odoratus.*

Six red-flowered annuals:
Cockscomb, *Celosia* spp.
Gaillardia spp.
Helichrysum bracteatum.
Linum grandiflorum, var. *rubrum.*
Poppy, *Papaver* spp.
Rose Moss, *Portulacca grandiflora.*

Six annuals with variegated flowers:
Butterfly-flower, *Schizanthus* spp.
Godetia, *Œnothera* spp.
Helipterum Manglesii.
Monkey-flower, *Mimulus* spp.
Petunia spp.
Phlox Drummondii.

Six annuals less than one foot high:
Alyssum, Sweet, *Alyssum maritimum.*
Ice-plant, *Mesembryanthemum crystallinum.*
Lobelia Erinus.
Nemophila spp.
Pansy, *Viola tricolor.*
Rose Moss, *Portulacca grandiflora.*

Six annuals between one and two feet high:
Baby's Breath, *Gypsophila elegans.*
Clarkia elegans.
Marigold, *Tagetes* spp.
Mignonette, *Reseda* spp.
Mimulus spp.
Petunia spp.

Six annuals between two and three feet high:
Amaranths, *Amarantus* spp.
Bartonia, *Mentzelia Lindleyi.*
Cotton, *Gossypium herbaceum.*
Polypteris Hookeriana.
Poppy, *Papaver* spp.
Mourning-bride, *Scabiosa* spp.

Six annuals more than three feet high:
Bean, Castor, *Ricinus communis.*
Corn, Japanese variegated, *Zea Mays*, var. *Japonicus.*
Cosmos spp.
Hemp, Giant, *Cannabis sativa*, var *gigantea.*
Moluccella spinosa.
Nicotiana alata.

PERENNIALS (See Chapter II)

Ten of the most popular perennials:
Anemone spp.
Columbine, *Aquilegia* spp.
Coneflower, *Rudbeckia* spp.
Hollyhock, *Althæa rosea.*
Iris spp.
Larkspur, *Delphinium formosum.*
Peony, *Pæonia* spp.
Phlox spp.
Poppy, *Papaver* spp.
Sunflower, *Helianthus* spp.

Ten perennials useful for cut flowers:
Anemone Japonica.
Columbine, *Aquilegia* spp.
Daisy, Giant, *Pyrethrum uliginosum.*
Gaillardia aristata.
Gas-plant, *Dictamnus albus.*
Larkspur, *Delphinium formosum.*
Pinks, *Dianthus* spp.
Rocket, Sweet, *Hesperis matronalis.*
Snapdragon, *Antirrhinum* spp.
Sunflower, *Helianthus debilis.*

Six perennials with fragrant flowers:
Gas-plant, *Dictamnus albus*
Goldentuft, *Alyssum, saxatile*, var. *compactum.*
Ground Nut, *Apios tuberosa.*
Rock-cress, *Arabis albida.*
Rocket Sweet, *Hesperis matronalis.*
Scotch Pink, *Dianthus plumarius.*

Six perennials with everlasting flowers:
Ammobium alatum.
Briza maxima (grass).
Bromus brizæformis (grass).
Cat's Ear, *Antennaria dioica.*
Helichrysum grandiflorum.
Statice incana.

Six perennials that will bloom the first season:
Butterfly Pea, *Centrosema Virginiana.*
Chrysanthemum morifolium.
Gaillardia aristata.
Larkspur, *Delphinium formosum.*
Pink, *Dianthus* spp.
Snapdragon, *Antirrhinum majus.*

Some perennials that may be cut after flowering for a second crop of bloom:
Coneflower, *Rudbeckia triloba.*
Larkspur, *Delphinium formosum.*
Goldentuft, *Alyssum saxatile.*

Six climbing perennials:
Butterfly Pea, *Centrosema Virginiana.*
Clematis Viorna, var. *coccinea.*
Dolichos Japonicus, *Pueraria Thunbergiana.*
Ground Nut, *Apios tuberosa.*
Hop, Common, *Humulus Lupulus.*
Perennial Pea, *Lathyrus latifolius.*

Six perennials that blossom longer than eight weeks:
Coral Bells, *Heuchera sanguinea.*
Marguerite, Golden, *Anthemis tinctoria.*
Perennial Pea, *Lathyrus latifolius.*
Poppy, Iceland, *Papaver nudicaule.*
Poppy-mallow, *Callirhoë involucrata*, var. *lineariloba*
Sunflower, *Helianthus multiflorus.*

Six perennials to remain undisturbed for years:
Gas-plant, *Dictamnus albus.*
Iris spp.
Peony, *Pæonia* spp.
Phlox spp.
Perennial Pea, *Lathyrus latifolius.*
Yucca filamentosa, etc.

Six perennials to be renewed every year or two:
Columbine, *Aquilegia cærulea.*
Coneflower, *Rudbeckia triloba.*
Daisy, English, *Bellis perennis.*
Hollyhock, *Althea rosea.*
Poppy, Iceland, *Papaver nudicaule.*
Snapdragon, *Antirrhinum majus.*

Six perennials likely to prove troublesome by spreading:
Balm, Fragrant, *Monarda didyma*
Candytuft, *Iberis sempervirens.*
Goldenrod, *Solidago rigida.*
Ground Nut, *Apios tuberosa.*
Poppy, Plume, *Bocconia cordata.*
Sacaline, *Polygonum Sachalinense.*

Six perennials for sunny places:
Coneflower, *Rudbeckia hirta.*
Gaillardia aristata.
Golden Marguerite, *Anthemis tinctoria.*
Poppy-mallow, *Callirhoë involucrata*, var. *lineariloba.*
Rock-cress, *Arabis albida.*
Sunflower, *Helianthus* spp.

Six perennials for shady places:
Anemone Pennsylvanica.
Bluebells, *Mertensia pulmonarioides.*
Bugleweed, *Ajuga reptens.*
Helleborus niger.
Phlox divaricata.
Shooting Star, *Dodecatheon Meadia.*

Six perennials for cold climates:
Goldentuft, *Alyssum saxatile.*
Lychnis alpina.
Moss Pink, *Phlox subulata.*
Poppy, Iceland, *Papaver nudicaule.*
Rocket, Sweet, *Hesperis matronalis.*
Saxifrage, *Saxifraga* spp.

Six perennials for warm climates:
Chrysanthemum spp.
Coneflower, *Rudbeckia hirta.*
Dianthus spp.
Funkia spp.
Gunnera manicata.
Iris Japonica.

Six drought-resisting perennials:
Baby's Breath, *Gypsophila paniculata.*
Coneflower, *Rudbeckia hirta.*
Inula grandiflora.
Sedum spp.
Sunflower, *Helianthus* spp.
Yucca filamentosa, etc.

Six perennials that bloom after a frost:
Chrysanthemum spp.
Goldentuft, *Alyssum saxatile.*
Gaillardia aristata.
Goldenrod, *Solidago* spp.
Perennial Pea, *Lathyrus latifolius.*
Poppy, Iceland, *Papaver nudicaule.*

Six perennials for rocky places:
Anemone blanda.
Bluebells, *Mertensia pulmonarioides.*
Columbine, *Aquilegia* spp.
Moss-pink, *Phlox subulata.*
Rock-cress, *Arabis albida.*
Sun Rose, *Helianthemum Chamæcistus.*

Six perennials for sandy soil:
Blazing-star, *Liatris* spp.
Helichrysum arenarium.
Poppy-mallow, *Callirhoë involucrata*, var. *lineariloba.*
Sacaline, Polygonum Sachalinense.
Sunflower, *Helianthus* spp.
Sun-rose, *Helianthemum canadense.*

Six perennials for heavy soil:
Columbine, *Aquilegia* spp.
Forget-me-not, *Myosotis palustris.*
Gas-plant, *Dictamnus albus.*
Larkspur, *Delphinium formosum.*
Peony, *Pæonia* spp.
Phlox spp.

Six perennials for moist or low ground:
Balm, Fragrant, *Monarda didyma.*
Cardinal Flower, *Lobelia cardinalis.*
Funkia spp.
Iris lævigata.
Joe-Pye-weed, *Eupatorium purpureum*
Ranunculus aquaticus.

Six perennials that re-sow themselves:
Beard-tongue, *Pentstemon* spp.
Cardinal Flower, *Lobelia cardinalis.*
Clematis Viorna, var. *coccinea.*
Forget-me-not, *Myosotis palustris.*
Gas-plant, *Dictamnus albus.*
Snapdragon, *Antirrhinum majus.*

Six perennials with striking foliage:
Adam's Needle, *Yucca filamentosa.*
Anemone Japonica.
Eulalia, *Miscanthus Sinensis*, var. *zebrinus.*
Funkia spp.
Giant Reed, *Arundo Donax.*
Poppy, Plume, *Bocconia cordata.*

Six perennials less than one foot high:
Candytuft, *Iberis sempervirens.*
Daisy, English, *Bellis perennis.*
Forget-me-not, *Myosotis palustris.*
Moss Pink, *Phlox subulata*
Rock-cress, *Aubrietia deltoidea.*
Shooting-star, *Dodecatheon Meadia.*

Six perennials from one to two feet high:
Achillea ptarmica.
Balm, Fragrant, *Monarda didyma.*
Columbine, *Aquilegia Canadensis.*
Funkia subcordata.
Lychnis Viscaria.
Poppy, Iceland, *Papaver nudicaule.*

Six perennials from two to three feet high:
Bleeding-heart, *Dicentra* spp.
Canterbury-bell, *Campanula Medium.*
Cardinal Flower, *Lobelia cardinalis.*
Flame Flower, *Kniphofia aloides.*
Gas-plant, *Dictamnus albus.*
Peony, *Pæonia* spp.

Six perennials from three to four feet high:
Adam's Needle, *Yucca filamentosa.*
Daisy, Giant, *Pyrethrum uliginosum.*
Larkspur, *Delphinium formosum.*
Poppy, Oriental, *Papaver orientale.*
Sunflower, *Helianthus multiflorus.*
Tree Peony, *Pæonia Moutan.*

Six perennials from four to six feet high:
Coneflower, *Rudbeckia maxima.*
Hollyhock, *Althea rosea.*
Japanese Eulalia, *Miscanthus*, var. *variegatus.*
Joe-Pye-weed, *Eupatorium purpureum*
Ravenna Grass, *Erianthus Ravennæ.*
Zebra Grass, *Miscanthus Sinensis*, var. *zebrinus.*

Six perennials taller than six feet:
Bugbane, *Cimicifuga racemosa.*
Crambe cordifolia.
Grass, Giant Rye, *Elymus condensatus.*
Reed, Giant, *Arundo Donax.*
Sacaline, *Polyganum Sachalinense.*
Sunflower, *Helianthus orgyalis.*

Six white-flowered perennials:
Achillea ptarmica.
Adam's Needle, *Yucca filamentosa.*
Astilbe Japonica.
Daisy, *Bellis perennis.*
Day Lily, *Funkia* spp.
Rock-cress, *Arabis albida.*

Six lilac, magenta and purple-flowered perennials:
Beard-tongue, *Pentstemon* spp.
Blazing-star, *Liatris elegans.*
Gas-plant, *Dictamnus albus.*
Pink, Fringed, *Dianthus superbus.*
Rock-cress, *Aubrietia deltoidea.*
Shooting-star, *Dodecatheon Meadia.*

Six blue-flowered perennials:
Anemone blanda.
Clematis Davidiana.
Columbine, Rocky Mountain, *Aquilegia cærulea.*
Forget-me-not, *Myosotis palustris.*
Iris lævigata.
Larkspur, *Delphinium formosum.*

Six yellow-flowered perennials:
Columbine, *Aquilegia chrysantha.*
Coneflower, *Rudbeckia* spp.
Gaillardia aristata.
Goldentuft, *Alyssum saxatile*, var. *compactum.*
Poppy, Iceland, *Papaver nudicaule.*
Sunflower, *Helianthus* spp.

Six pink-flowered perennials:
Bleeding-heart, *Dicentra* spp.
Hollyhock, *Althea rosea.*
Lychnis Viscaria, var. *splendens*
Moss-pink, *Phlox subulata.*
Peony, *Pæonia* spp.
Pink, *Dianthus* spp.

Six red-flowered perennials:
Anemone Japonica.
Balm, Fragrant, *Monarda didyma.*
Cardinal Flower, *Lobelia cardinalis.*
Clematis Viorna, var. *coccinea.*
Coral Bells, *Heuchera sanguinea.*
Peony, *Pæonia* spp.

Perennials with variegated flowers: Many cultivated varieties of such perennials as *Lychnis Viscaria*, *Phlox paniculata*, *Dianthus*, etc.

Six perennials that bloom in April or earlier:
Anemone blanda.
Bloodroot, *Sanguinea Canadensis.*
Bluebells, *Mertensia pulmonarioides.*
Candytuft, *Iberis sempervirens.*
Daisy, English, *Bellis perennis.*
Shooting-star, *Dodecatheon Meadia.*

Six perennials that bloom in May:
Ajuga reptans.
Alpine Lamp Plant, *Lychnis alpina.*
Forget-me-not, *Myosotis palustris.*
Moss Pink, *Phlox subulata.*
Rock-cress, *Arabis albida.*
Tree Peony, *Pæonia Moutan.*

Six perennials that bloom in June:
Achillea ptarmica.
Bleeding-heart, *Dicentra* spp.
Columbine, *Aquilegia glandulosa.*
Leopard's Bane, *Doronicum plantagineum* var. *excelsum.*
Peony, *Pæonia officinalis.*
Rock-cress, *Aubrietia deltoidea.*

Six perennials that bloom in July:
Adam's Needle, *Yucca filamentosa.*
Blazing-star, *Liatris elegans.*
Canterbury-bell, *Campanula Medium.*
Clematis Viorna, var. *coccinea.*
Gas-plant, *Dictamnus albus.*
Poppy, Iceland, *Papaver nudicaule.*

Six perennials that bloom in August:
Balm, Fragrant, *Monarda didyma.*
Butterfly Pea, *Centrosema Virginiana.*
Ground Nut, *Apios tuberosa.*
Hollyhock, *Althea rosea.*
Lychnis Viscaria.
Sunflower, *Helianthus multiflorus.*

Six perennials that bloom in September:
Cardinal Flower, *Lobelia cardinalis.*
Clematis Viorna, var. *coccinea.*
Coneflower, *Rudbeckia maxima.*
Daisy, Giant, *Pyrethrum uliginosum.*
Funkia lancifolia.
Perennial Pea, *Lathyrus latifolius.*

Six perennials that bloom in October or later:
- *Chrysanthemum* spp.
- *Gaillardia aristata.*
- Goldenrod, *Solidago rigida.*
- Goldentuft, *Alyssum saxatile.*
- Poppy, Iceland, *Papaver nudicaule.*
- Poppy-mallow, *Callirhoë involucrata.*

SHRUBS (See Chapter III)

Ten of the most popular shrubs:
- Barberry, *Berberis vulgaris.*
- Currant, Golden, *Ribes aureum.*
- *Deutzia gracilis.*
- *Hydrangea paniculata grandiflora.*
- Lilac, *Syringa vulgaris.*
- *Rhododendron Catawbiense.*
- Snowball, *Viburnum Opulus.*
- *Spiræa* spp.
- Syringa or Mock-orange, *Philadelphus coronarius.*
- Weigela, *Diervilla Japonica.*

Ten shrubs with fragrant flowers:
- Alder, White, *Clethra alnifolia.*
- Allspice, Carolina, *Calycanthus floridus.*
- Amorpha, Fragrant, *Amorpha fruticosa,* var. *fragrans.*
- Currant, Golden, *Ribes aureum.*
- *Daphne Mezereum.*
- Elder, *Sambucus Canadensis.*
- Lilac, *Syringa vulgaris.*
- Mock-orange or Syringa, *Philadelphus coronarius.*
- Oleaster, *Eleagnus argentea.*
- Sheepberry, *Viburnum Lentago.*

Ten shrubs whose individual flowers are large and showy:
- *Azalea Calendulacea.*
- *Azalea rhombica.*
- Carolina Allspice, *Calycanthus floridus.*
- *Magnolia Soulangiana.*
- *Magnolia stellata.*
- *Rhododendron Catawbiense.*
- Kerria, White, *Rhodotypos kerrioides.*
- *Rosa rugosa.*
- Rose of Sharon, *Hibiscus Syriacus.*
- *Stuartia pentagyna.*

The shrubs which are completely covered with small but numerous flowers:
- Buckeye, Dwarf, *Æsculus parviflora.*
- Buttonbush, *Cephalanthus occidentalis.*
- *Daphne Mezereum.*
- Exochorda, *Exorchorda grandiflora.*
- Fringe-tree, *Chionanthus Virginica.*
- Judas-tree, *Cercis Canadensis.*
- Quince, Japanese, *Cydonia Japonica.*
- Smoke-tree, *Rhus Cotinus.*
- Spicebush, *Lindera Benzoin.*
- Thorn, *Cratægus Crus-galli.*

Six shrubs that blossom for eight or more weeks:
- Cinquefoil, Shrubby, *Potentilla fruticosa.*
- Kerria, *Kerria Japonica.*

Shrubs that blossom for eight or more weeks —*Continued*
- Pepperbush, Sweet, *Clethra alnifolia.*
- Red Root, *Ceanothus Americanus.*
- St. John's Wort, *Hypericum prolificum*
- Staggerbush, *Pieris Mariana.*

Six shrubs useful for cut flowers:
- Almond, Double Flowering, *Prunus Japonica.*
- Currant, Golden, *Ribes aureum.*
- *Deutzia gracilis.*
- Lilac, *Syringa vulgaris.*
- Snowball, *Viburnum Opulus.*
- *Spiræa* spp.

Six shrubs attractive in fruit:
- Barberry, Thunberg's, *Berberis Thunbergii.*
- Burning-bush, *Euonymus atropurpureus.*
- Currant, Indian, *Symphoricarpus vulgaris.*
- Kerria, White, *Rhodotypos kerrioides*
- Snowberry, *Symphoricarpus racemosus.*
- Strawberry-bush, *Euonymus alatus.*

Six shrubs attractive in foliage:
- Allspice, Carolina, *Calycanthus floridus.*
- Golden-bell, *Forsythia suspensa.*
- Hydrangea, Oak-leaved, *Hydrangea quercifolia.*
- Oleaster, *Elæagnus argentea.*
- Raspberry, Flowering, *Rubus odoratus.*
- Swallow Thorn, *Hippophaë rhamnoides.*

Six deciduous shrubs attractive during winter:
- Barberry, *Berberis Thunbergii.*
- Bramble, Japanese, *Rubus cratægifolius.*
- Kerria, *Kerria Japonica.*
- Kerria, White, *Rhodotypos kerrioides.*
- Swallow Thorn, *Hippophaë rhamnoides.*
- Winterberry, *Ilex verticellata.*

Six evergreen shrubs:
- Juniper, *Juniperus communis.*
- Laurel, Mountain, *Kalmia latifolia.*
- Mahonia, *Berberis Aquifolium.*
- *Pieris floribunda.*
- Pine, Dwarf, *Pinus pumila.*
- *Rhododendron Catawbiense.*

Six shrubs attractive because of autumn colors with splendid foliage:
- Barberry, Thunberg's, *Berberis Thunbergii.*
- Burning-bush, *Euonymus atropurpureus.*
- Rose, Japanese, *Kerria Japonica.*
- Strawberry-bush, *Euonymus alatus.*
- Sumac, Dwarf, *Rhus copallina.*
- Willow, Virginia, *Itea Virginica.*

Shrubs with variously colored foliage:
- Numerous horticultural varieties of many species, *e. g.:*
- Purple-leaved Plum, Filbert and Barberry.
- Golden-leaved Elderberry, Syringa and Hop-tree.
- Variegated-leaved Althea, Weigela, Dogwood.

Shrubs to be protected from the winter sun:
Certain evergreens with broad leaves, such as andromeda, mahonia, and some rhododendrons. Planting on a northern exposure or in the shade of evergreens or even very branchy trees is generally effective.

Four shrubs with coloured bark:
- Bailey's Osier, *Cornus Baileyi.*
- Bramble, Japanese, *Rubus cratægifolius.*
- Kerria, *Kerria Japonica.*
- Strawberry-bush, *Euonymus Americanus.*

Four shrubs that resist drought:
- Cherry, Sand, *Prunus Bessyi.*
- St. John's Wort, *Hypericum Kalmianum.*
- Swallow Thorn, *Hippophaë rhamnoides.*
- Tamarisk, *Tamarix Chinensis.*

Four shrubs likely to become troublesome by suckering, etc.:
- Cinquefoil, Shrubby, *Potentilla fruticosa.*
- Ozier, Red-twigged, *Cornus stolonifera.*
- Raspberry, Flowering, *Rubus odoratus.*
- Swallow Thorn, *Hippophaë rhamnoides.*

Four shrubs for warm climates:
- Allspice, Carolina, *Calycanthus floridus.*
- Camellia, American, *Stuartia pentagyna.*
- Oleaster, *Elæagnus argentea.*
- Weigela, *Diervilla* spp.

Four shrubs for cold climates:
- Buttonbush, *Cephalanthus occidentalis.*
- *Daphne Mezereum.*
- St. John's Wort, *Hypericum Kalmianum.*
- Sheepberry, *Viburnum Lentago.*

Four shrubs suitable for sunny places:
- Allspice, Carolina, *Calycanthus floridus.*
- Indigo, Bastard, *Amorpha fruticosa.*
- Oleaster, *Elæagnus argentea.*
- Spiræa, Blue, *Caryopteris Mastacanthus.*

Four shrubs suitable for shady places:
- *Andromeda floribunda.*
- Mahonia, *Berberis Aquifolium.*
- Mountain Laurel, *Kalmia latifolia.*
- St. John's Wort, *Hypericum aureum.*

Four shrubs suitable for heavy soil:
- Cinquefoil, Shrubby, *Potentilla fruticosa.*
- Lilac, *Syringa vulgaris.*
- Rose of Sharon, *Hibiscus Syriacus.*
- Thorn, *Cratægus Crus-galli.*

Four shrubs suitable for light soil:
- Bearberry, Red, *Arctostaphylos Uva-Ursi.*
- Cherry, Sand, *Prunus pumila.*
- St. Andrew's Cross, *Ascyrum hypericoides.*
- St. John's Wort, *Hypericum prolificum.*

Four shrubs suitable for rocky places:
- Barberry, Creeping, *Berberis repens.*
- Bearberry, Red, *Arctostaphylos Uva-Ursi.*
- Crowberry, *Empetrum nigrum.*
- Sweet Fern, *Comptonia asplenifolia.*

Four shrubs suitable for moist soil:
- Alder, White, *Clethra alnifolia.*
- Holly, Mountain, *Nemopanthus fascicularis.*
- Spicebush, *Benzoin odoriferum.*
- Willow, Virginian, *Itea Virginica.*

Four shrubs suitable for the seashore:
- Bearberry, Red, *Arctostaphylos Uva-Ursi.*
- Cherry, Sand, *Prunus pumila.*
- Swallow Thorn, *Hippophaë rhamnoides*
- Tamarisk, *Tamarix Chinensis.*

Four shrubs that bloom in April or earlier:
- *Daphne Mezereum.*
- Goldenbell, *Forsythia suspensa.*
- Juneberry, *Amelanchier Canadensis.*
- Quince, Japanese, *Cydonia Japonica.*

Four shrubs that bloom in May:
- Barberry, *Berberis vulgaris.*
- Kerria, White, *Rhodotypos kerrioides.*
- Lilac, *Syringa vulgaris.*
- Silverbell, *Habenaria tetraptera.*

Four shrubs that bloom in June:
- Amorpha, Fragrant, *Amorpha fruticosa*, var. *fragrans.*
- Corchorus, *Kerria Japonica.*
- *Deutzia gracilis.*
- Oleaster, *Elæagnus argentea.*

Four shrubs that bloom in July:
- Buttonbush, *Cephalanthus occidentalis.*
- Pepperbush, Sweet, *Clethra alnifolia.*
- St. John's Wort, *Hypericum prolificum.*
- *Spiræa Douglasii.*

Four shrubs that bloom in August:
- Alder, Sweet, *Clethra alnifolia.*
- *Hydrangea paniculata grandiflora.*
- Spiræa, Blue, *Caryopteris Masticanthus.*
- *Spiræa Bullata.*

Four shrubs that bloom in September or later:
- *Gordonia pubescens* (not fully hardy).
- Witch-hazel, *Hamamelis Virginiana.*
- Spiræa, Blue, *Caryopteris Mastacanthus.*
- *Spiræa conspicua.*

Four shrubs less than two feet high:
- Barberry, Creeping, *Berberis repens.*
- Bunchberry, *Cornus Canadensis.*
- *Daphne Cneorum.*
- St. Andrew's Cross, *Ascyrum hypericoides.*

Four shrubs between two and five feet high:
- Barberry, Thunberg's, *Berberis Thungergii.*
- Redroot, *Ceanothus Americanus.*
- St. John's Wort, *Hypericum prolificum.*
- Spiræa, Blue, *Caryopteris Mastacanthus.*

Four shrubs between five and eight feet high:
- Barberry, Common, *Berberis vulgaris.*
- Goldenbell, *Forsythia suspensa.*
- Quince, Japanese, *Cydonia Japonica.*
- Rose, Japanese, *Kerria Japonica.*

Four shrubs between eight and twelve feet high:
- Buttonbush, *Cephalanthus occidentalis.*
- Oleaster, *Elæagnus argentea.*
- Silverbell, *Halesia tetraptera.*
- Smoke-tree, *Rhus Cotinus.*

Four shrubs between twelve and twenty feet high:
- Amorpha, Fragrant, *Amorpha fruticosa* var. *fragrans*.
- Burning-bush, *Euonymus atropurpureus*.
- Swallowthorn, *Hippophaë rhamnoides*.
- Tamarisk, *Tamarix Chinensis*.

Four shrubs with white flowers:
- *Deutzia gracilis*.
- Exochorda, *Exochorda grandiflora*.
- Pepperbush, *Clethra alnifolia*.
- Silverbell, *Halesia tetraptera*.

Four shrubs with purple flowers:
- *Daphne Mezereum*.
- Indigo, False, *Amorpha fruticosa*.
- Flowering Raspberry, *Rubus odoratus*.
- Smoke-tree, *Rhus Cotinus*.

Two shrubs with blue flowers:
- *Amorpha herbacea*.
- *Callicarpa Americana*.

Four shrubs with yellow flowers:
- Barberry, Common, *Berberis vulgaris*.
- Currant, Golden, *Ribes aureum*.
- Goldenbell, *Forsythia suspensa*.
- Rose, Japanese, *Kerria Japonica*.

Four shrubs with red flowers:
- Currant, Red-flowered, *Ribes sanguineum*.
- *Diervilla*, spp.
- Quince, Japanese, *Cydonia Japonica*.
- *Spiræa Douglasii*.

Ten of the most popular hedge plants:
- Arbor-vitæ, American, *Thuya occidentalis*.
- Hemlock, *Tsuga Canadensis*.
- Holly, *Ilex crenata*, var. *microphylla*.
- Honeysuckle, Tartarian, *Lonicera Tatarica*.
- Locust, Honey, *Gleditschia triacanthos*.
- Osage Orange, *Maclura aurantiaca*.
- Privet, California, *Ligustrum ovalifolium*.
- Quince, Japanese, *Cydonia Japonica*.
- Spruce, Norway, *Picea excelsa*.
- Thorn, Cockspur, *Cratægus Crus-galli*.

Four evergreen hedge plants:
- Arbor-vitæ, American, *Thuya occidentalis*.
- Hemlock, *Tsuga Canadensis*.
- Holly, *Ilex crenata*, var. *microphylla*.
- Spruce, Norway, *Picea excelsa*.

Four flowering hedge plants:
- Barberry, Thunberg's, *Berberis Thunbergii*.
- *Deutzia gracilis*.
- Quince, Japanese, *Cydonia Japonica*.
- *Spiræa prunifolia*.

Four deciduous hedge plants:
- Buckthorn, *Rhamnus cathartica*.
- Honeysuckle, Tartarian, *Lonicera Tatarica*.
- Lilac, *Syringa vulgaris*.
- Thorn, Cockspur, *Cratægus Crus-galli*.

TREES (See Chapter IV)

Ten of the most popular trees:
- Basswood. *Cilia Americana*
- Buttonwood, *Platanus occidentalis*.

Most popular trees—*Continued*
- Chestnut, *Castanea Americana*.
- Elm, American, *Ulmus Americana*.
- Horse-chestnut, *Æsculus Hippocastanum*.
- Locust, *Robinia Pseudacacia*.
- Locust, Honey, *Gleditschia triacanthos*.
- Maple, Sugar, *Acer sacharum*.
- Pine, White, *Pinus strobus*.
- Spruce, Norway, *Picea excelsa*.

Six trees with ornamental foliage:
- Angelica-tree, Chinese, *Aralia Chinensis*.
- *Catalpa speciosa*.
- Coffee-tree, Kentucky, *Gymnocladus Canadensis*.
- Cucumber-tree, Large-leaved, *Magnolia macrophylla*.
- Locust, Honey, *Gleditschia triacanthos*.
- Papaw, *Asimina triloba*.

Six trees with fragrant flowers:
- Linden, American, *Tilia Americana*.
- Locust, Black, *Robinia Pseudacacia*.
- Magnolia, *Yulan*.
- Magnolia, *Hypoleuca*.
- *Pterostyrax hispida*.
- Yellow-wood, *Cladrastis tinctoria*.

Six trees with large individual flowers:
- Dogwood, Flowering, *Cornus Florida*.
- *Gordonia pubescens* (not fully hardy).
- Magnolia, *Hypoleuca*.
- Magnolia, *Yulan*.
- Papaw, American, *Asimina triloba*.
- Tulip-tree, *Liriodendron Tulipifera*.

Six trees covered with small but numerous flowers:
- *Catalpa speciosa*.
- Goldenchain, *Laburnum vulgare*.
- Laurel, Great, *Rhododendron maximum*.
- Lilac, Japanese, *Syringa Japonica*.
- Maple, Red, *Acer rubrum*.
- Yellow-wood, *Cladrastis tinctoria*.

Six trees with attractive autumn foliage:
- Maple, Sugar, *Acer sacharum*.
- Oak, White, *Quercus alba*.
- Pepperidge, *Nyssa sylvatica*.
- Sassafras, *Sassafras officinale*.
- Sweet-gum, *Liquidambar styraciflua*.
- Tulip-tree, *Liriodendron Tulipifera*.

Four evergreen trees:
- Holly, American, *Ilex opaca*.
- Laurel, Giant, *Rhododendron maximum*.
- Pine, White, *Pinus strobus*.
- Spruce, Norway, *Picea excelsa*.

Four deciduous trees, attractive during winter:
- Birch, Paper, *Betula papyrifera*.
- Pagoda-tree, Japanese, *Sophora Japonica*.
- Sumac, Staghorn, *Rhus typhina*.
- Willow, Yellow, *Salix Vitellina*.

Four trees with showy fruits:
- Cucumber-tree, Large-leaved, *Magnolia macrophylla*.
- Holly, American, *Ilex opaca*.

Trees with showy fruits—*Continued*
- Mountain Ash, American, *Sorbus Americana.*
- Sumac, Staghorn, *Rhus typhina.*

Six trees suitable for city planting:
- Ash, American, *Fraxinus Americana.*
- Buttonwood, *Platanus occidentalis.*
- Locust, Honey, *Gleditschia triacanthos.*
- Maidenhair-tree, *Ginkgo biloba.*
- Pagoda-tree, Japanese, *Sophora Japonica.*
- Tree of Heaven, *Ailanthus glandulosa* (pistillate).

Four trees suitable for seaside planting:
- Juniper, *Juniperus Virginica.*
- Sassafras, *Sassafras officinalis.*
- Spruce, White, *Picea alba.*
- Tree of Heaven, *Ailanthus glandulosa* (pistillate).

Four weeping trees and trees with coloured foliage:
- Horticultural varieties of numerous species, *e. g.*, Maple, Birch, Beech, Poplar, Oak, Willow, Elm, etc.

Four trees that bloom in April or earlier:
- Maple, Red, *Acer rubrum.*
- Shadbush, *Amelanchier Canadensis.*
- Judas-tree, *Cercis Canadensis.*
- *Magnolia Yulan.*

Four trees that bloom in May:
- Dogwood, Flowering, *Cornus florida.*
- Golden-chain, *Laburnum vulgare.*
- *Magnolia Soulangeana.*
- Tulip-tree, *Liriodendron Tulipifera.*

Four trees that bloom in June:
- *Catalpa speciosa.*
- Locust, Black, *Robinia Pseudacacia.*
- *Magnolia hypoleuca.*
- *Pterostyrax hispida*

Four trees that bloom in July:
- Chestnut, American, *Castanea Americana.*
- Laurel, Great, *Rhododendron maximum.*
- Lilac, Japanese, *Syringa Japonica.*
- *Rhus semialata.*

Four trees that bloom in August:
- Angelica-tree, Chinese, *Aralia Chinensis.*
- Sorrelwood, *Oxydendrum arboreum.*
- Tamarisk, *Tamarix Gallica.*
- Varnish-tree, *Kœlreuteria paniculata.*

Four trees that bloom in September:
- Angelica-tree, Chinese, *Aralia Chinensis.*
- *Gordonia pubescens* (not fully hardy).
- Pagoda-tree, Japanese, *Sophora Japonica.*
- *Rhus semialata.*

VINES (See Chapter V)

Ten of the most popular vines:
- *Actinidia arguta.*
- Boston Ivy, *Ampelopsis tricuspidata.*
- *Clematis* spp.
- *Cobæa scandens.*
- Dutchman's Pipe, *Aristolochia macrophylla.*
- Honeysuckle, *Lonicera* spp.
- Ivy, English, *Hedera Helix.*
- Pea, Perennial, *Lathyrus latifolius.*
- Trumpet-creeper, *Tecoma radicans.*
- *Wistaria Chinensis.*

Six vines with showy flowers:
- *Clematis* spp.
- *Cobæa scandens.*
- Honeysuckle, *Lonicera* spp.
- Moonflower, *Ipomœa Bona-nox.*
- Pea, Perennial, *Lathyrus latifolius.*
- Trumpet-creeper, *Tecoma radicans.*

Six vines with attractive foliage:
- *Actinidia arguta.*
- *Akebia quinata.*
- Boston Ivy, *Ampelopsis tricuspidata.*
- Dutchman's Pipe, *Aristolochia macrophylla.*
- Hop, Japanese, *Humulus Japonicus*, var. *variegatus.*
- Silk Vine, *Periploca Græca.*

Six annual vines:
- Balloon-vine, *Cardiospermum Halicacabum.*
- Bean, Scarlet Runner, *Phaseolus multiflorus.*
- Canary-bird Flower, *Tropæolum peregrinum.*
- *Ipomœa versicolor.*
- *Maurandia Barclaiana.*
- *Thunbergia alata.*

Six herbaceous perennial vines:
- Cinnamon-vine, *Dioscorea divaricata.*
- Clematis, Scarlet, *Clematis Viorna*, var. *coccinea.*
- Ground Nut, *Apios tuberosa.*
- Hop, Common, *Humulus Lupulus.*
- Pea, Butterfly, *Centrosema Virginiana.*
- Pea, Perennial, *Lathyrus latifolius.*

Six vines with fragrant flowers:
- *Actinidia polygama.*
- *Akebia quinata.*
- Cinnamon-vine, *Dioscorea divaricata.*
- Ground Nut, *Apios tuberosa.*
- Honeysuckle, Hall's, *Lonicera Halliana.*
- Silk-vine, *Periploca Græca.*

Six vines that bloom for more than four weeks:
- *Clematis Viorna*, var. *coccinea.*
- *Cobæa scandens.*
- Honeysuckle, Hall's, *Lonicera Halliana.*
- Morning-glory, *Ipomœa purpurea.*
- Pea, Perennial, *Lathyrus latifolius.*
- Trumpet creeper, *Tecoma radicans.*

Six woody perennial vines:
- *Akebia quinata.*
- Bitter-sweet, *Celastrus scandens.*
- Matrimony Vine, *Lycium Chinense.*
- Silk Vine, *Periploca Græca.*
- Trumpet-creeper, *Tecoma radicans.*
- *Wistaria Chinensis.*

FERNS (See Chapter VI)

- Six of the most popular hardy ferns:
  - Christmas Fern, *Polystichum acrostichoides.*
  - Eagle Fern, *Pteris aquilina.*
  - Maidenhair, *Adiantum pedatum.*
  - Ostrich Fern, *Matteuccia Struthiopteris.*
  - Polypody, *Polypodium vulgare.*
  - Royal Fern, *Osmunda regalis.*
- Four hardy ferns suitable for damp places:
  - Marsh Fern, *Dryopteris Thelypteris.*
  - Royal Fern, *Osmunda regalis.*
  - Sensitive Fern, *Onoclea sensibilis.*
  - Wood Fern, *Dryopteris cristata.*
- Four hardy ferns that will stand sunlight:
  - Eagle Fern, *Pteris aquilina.*
  - New York Fern, *Dryopteris Noveboracense.*
  - Royal Fern, *Osmunda regalis.*
  - Sensitive Fern, *Onoclea sensibilis.*
- Four hardy ferns that need shade:
  - Chain Fern, *Woodwardia angustifolia.*
  - Lady Fern, *Felix-fœmina.*
  - Maidenhair, all spp.
  - Oak Fern, *Phegapteris Dryopteris.*
- Four hardy ferns that succeed in partial shade:
  - Cinnamon Fern, *Onoclea cinnamomea.*
  - Ebony Spleenwort, *Asplenium platyneuron.*
  - Purple-stemmed Cliff Brake, *Pellæa atropurpurea.*
  - Royal Fern, *Osmunda regalis.*
- Four ferns suitable for dry places:
  - Brittle Fern, *Cystopteris fragilis.*
  - Chain Fern, *Woodwardia Virginica.*
  - Polypody, *Polypodium vulgare.*
  - Purple-stemmed Cliff Brake, *Pellæa atropurpurea.*
- Four evergreen ferns:
  - Ebony Spleenwort, *Asplenium ebeneum.*
  - Grape Fern, Cut-leaved, *Botrychium dissectum.*
  - Hairy-lip Fern, *Cheilanthes vestitia.*
  - Polypody, *Polypodium vulgare.*

BULBS (See Chapter VII)

- Ten of the most popular hardy bulbs:
  - *Crocus* spp.
  - Daffodil, *Narcissus Pseudo-Narcissus.*
  - *Gladiolus* spp.
  - Hyacinth, *Hyacinthus* spp.
  - Jonquil, *Narcissus Jonquilla.*
  - Lily, *Lilium* spp.
  - Narcissus, Poet's, *Narcissus poeticus.*
  - Tiger Flower, *Tigridia* spp.
  - Tulip, *Tulipa* spp.
  - Zephyr Flower, *Zephyranthes* spp.
- Six bulbs for April or earlier bloom:
  - *Crocus* spp.
  - Crown-Imperial, *Fritillaria Imperialis.*
  - Glory of the Snow, *Chionodoxa Luciliæ.*
  - Hyacinth, Grape, *Muscari moschatum.*

Bulbs for April—*Continued*
  - Snowdrop, *Galanthus nivalis.*
  - Snowflake, Spring, *Leucojum vernum*
- Six hardy bulbs for May bloom:
  - Daffodil, *Narcissus Pseudo-narcissus.*
  - Hyacinth, *Hyacinthus* spp.
  - Jonquil, *Narcissus Jonquilla.*
  - *Puschkinia scilloides.*
  - Summer Snowflake, *Leucojum æstivum.*
  - Tulip, *Tulipa* spp.
- Six hardy bulbs that bloom in June:
  - *Anemone narcissiflora.*
  - Anemone, Poppy-Flowered, *Anemone coronaria.*
  - *Anemone Virginiana.*
  - Harebell, *Scilla festalis.*
  - Iris, Spanish, *Iris Xiphium.*
  - Lily, Cuban, *Scilla Peruviana.*
- Six bulbs that bloom in July:
  - Blazing-star, *Tritonia crocosmæflora.*
  - *Homeria collina.*
  - Hyacinth, Star, *Scilla autumnalis.*
  - *Lycoris sanguinea.*
  - Tiger Flower, *Tigridia buccifera.*
  - Zephyr Flower, *Zephyranthes carinata.*
- Six bulbs that bloom in August:
  - Blazing-star, *Tritonia crocata.*
  - *Gladiolus* spp.
  - Hyacinth, Giant Summer, *Galtonia candicans.*
  - Squill, Hyacinth, *Scilla Hyacinthioides.*
  - Tiger Flower, *Tigridia Pavonia.*
  - *Watsonia Meriana.*
- Six bulbs that bloom in September:
  - Hyacinth, Starry, *Scilla autumnalis.*
  - Lily, Guernsey, *Nerine sarniensis.*
  - *Lycoris aurea.*
  - Saffron, Meadow, *Colchicum autumnale.*
  - Snowflake, Autumn, *Leucojum autumnale.*
  - *Sternbergia lutea.*
- Six of the most popular plants with tubers, rhizomes, etc.:
  - *Begonia*, tuberous.
  - *Canna* spp.
  - *Dahlia* spp.
  - Elephant's Ear, *Colocasia antiquorum*, var. *esculentum.*
  - Lily-of-the-valley, *Convallaria majalis.*
  - Tuberose, *Polianthes tuberosa.*

AQUATIC AND BOG PLANTS (See Chapters VIII and IX)

- Ten of the most popular aquatics (excluding water-lilies):
  - Arrowhead, *Sagittaria* spp.
  - Arum, Water, *Calla* spp.
  - Cardinal Flower, *Lobelia cardinalis.*
  - Flag, Blue, *Iris* spp.
  - Floating-heart, *Limnanthemum lacunosum.*
  - Lotus, American, *Nelumbo* spp.
  - Pickerel-weed, *Pontederia* spp.

Most popular aquatics—*Continued*
Swamp-pink, *Helonias bullata.*
Victoria spp.
Water-lily, *Nymphæa* spp.

Four aquatic plants for bogs and gardens:
Cardinal Flower, *Lobelia cardinalis.*
Flag, Blue, *Iris versicolor.*
Pitcher Plant, California, *Darlingtonia Californica.*
Swamp-pink, *Helonias bullata.*

Four aquatics for ponds:
Floating-heart, *Limnanthemum lacunosum.*
Lotus, American, *Nelumbo lutea.*
Pondweed, Cape, *Aponogeton distachyum.*
Water-lily, *Nymphæa odorata*, etc.

Four aquatics that bloom in May or earlier:
Buck-bean, *Menyanthes trifoliata.*
Goldenclub, *Orontium aquaticum.*
Marsh Marigold, *Caltha palustris.*
Yellow Flag, *Iris Pseudacorus.*

Four aquatics that bloom in June:
Arrowhead, *Sagittaria latifolia.*
Arum, Water, *Calla palustris.*
Flag, Blue, *Iris versicolor.*
Water-lily, Sweet Scented, *Nymphæa odorata.*

Four aquatics that bloom in July:
Bur-reed, *Sparganium ramosum.*
Floating-heart, *Limnanthemum lacunosum.*
Nundo, *Ligusticum actæifolium.*
Pickerel-weed, *Pontederia cordata.*

Four aquatics that bloom in August:
Arrowhead, *Sagittaria latifolia.*
Hemlock, Water, *Cicuta maculata.*
Rice, Indian Water, *Zigania miliacea.*
Sundew, *Drosera rotundifolia.*

Four aquatics that bloom in September or later:
Cardinal Flower, *Lobelia cardinalis.*
Pondweed, Cape, *Aponogeton distachyum.*
Sundew, *Drosera filiformis.*
Water-lily, Sweet Scented, *Nymphæa odorata.*

Four aquatics less than one foot above the pond surface:
Arum, Water, *Calla palustris.*
Floating-heart, *Limnanthemum lacunosum.*
Pitcher Plant, California, *Darlingtonia Californica.*
Pondweed, Cape, *Aponogeton distachyum.*

Four aquatics from one to three feet high:
Flag, Blue, *Iris versicolor.*
Pickerel-weed, *Pontederia cordata.*
Pink, Swamp, *Helonias bullata.*
Turtlehead, *Chelone glabra.*

Four aquatics more than three feet high:
Aster, Purple Stem, *Aster puniceus.*
Cat-tail, Broad-leafed, *Typha latifolia.*
Nundo, *Ligusticum actæifolium.*
Rice, Indian Water, *Zigania miliacea.*

Four aquatics likely to spread unduly:
Arrowhead, *Sagittaria* spp.
Cat-tail, *Typha* spp.
Golden-club, *Orontium* spp.
Floating-heart, *Limnanthemum lacunosum.*

ALPINE PLANTS AND ROCK GARDENS

(See Chapter X)

Ten of the most popular rock plants:
Baby's Breath, *Gypsophila repens.*
Bluebells, *Campanula rotundifolia.*
Columbine, Common, *Aquilegia Canadensis.*
Daphne Cneorum.
Foxglove, *Digitalis purpurea.*
Gas-plant, *Dictamnus albus.*
Golden-tuft, *Alyssum saxatile.*
Moss-pink, *Phlox subulata.*
Poppy, Iceland, *Papaver nudicaule.*
Saxifraga crassifolia.

Four rock plants, annuals:
Clarkia elegans.
Daisy, Swan River, *Brachycome iberidifolia.*
Gilia micrantha.
Linaria alpina.

Four rock plants, herbaceous perennials:
Harebell, Carpathian, *Campanula carpatica.*
Lamp Flower, *Lychnis Alpina.*
Poppy, Alpine, *Papaver Alpinum.*
Rock-cress, *Aubrietia deltoidea.*

Four shrubby rock plants:
Barberry, Creeping, *Berberis repens.*
Crowberry, *Empetrum nigrum.*
Daphne Cneorum.
Laurel, Mountain, *Kalmia latifolia.*

Four rock plants that bloom in April or earlier:
Anemone blanda.
Bluebells, *Mertensia pulmonarioides.*
Daphne Cneorum.
Whitlow-grass, *Draba Alpina.*

Four rock plants that bloom in May:
Rock-cress, *Arabis albida.*
Moss-pink, *Phlox subulata.*
Alpine Anemone, *Anemone Alpina.*
Stellaria graminea.

Four rock plants that bloom in June:
Bunchberry, *Cornus Canadensis.*
Columbine, Alpine, *Aquilegia Alpina.*
Easter Bell, *Stellaria Holostea.*
Rock-cress, *Aubrietia deltoidea.*

Four rock plants that bloom in July:
Blazing-star, *Liatris spicata.*
Catchfly, German, *Lichnis Viscaria.*
Lobelia syphilitica.
Stonecrop, *Sedum acre.*

Four rock plants that bloom in August:
Anemone Japonica.
Poppy, Iceland, *Papaver nudicaule.*
Sedum ternatum.
Spraguea umbellata.

Four rock plants that bloom in September:
Alder, White, *Clethra alnifolia.*
Anemone Japonica.
Cardinal Flower, *Lobelia cardinalis.*
Sedum, Showy, *Sedum spectabile.*

Four rock plants that bloom in October or later:
Goldentuft, *Alyssum saxatile.*
Poppy, Iceland, *Papaver nudicaule.*
Poppy-mallow, *Callirhoë involucrata*
Sedum, Showy, *Sedum spectabile.*

WINDOW-GARDEN PLANTS
(See Chapter XI)

Ten of the most popular window-garden plants:
Abutilon spp.
Begonia spp.
Calla, *Richardia Africana.*
Cyclamen Persicum.
Fuchsia spp.
Geranium, *Pelargonium* spp.
Heliotrope, *Heliotropium* spp.
Oxalis spp.
Primrose, Chinese, *Primula Sinensis.*
Rubber Plant, *Ficus elastica.*

Ten window plants that may be transplanted from the garden:
Ageratum spp.
Abutilon spp.
Alyssum spp.
Begonia spp.
Candytuft, *Iberis* spp.
Coleus spp.
Fuchsia spp.
Geranium, *Pelargonium* spp.
Heliotrope, *Heliotropium* spp.
Lobelia Erinus.

Ten window plants that will stand extremes of neglect and coddling:
Agave Americana.
Begonia spp. (shrubby).
Calla, *Richardia Africana.*
Chinese Primrose, *Primula Sinensis.*
Cocos Weddelliana.
Cyclamen Latifolium.
Geranium, *Pelargonium* spp.
Grevillea robusta.
Livistona Chinensis.
Rubber Plant, *Ficus elastica.*

Ten vines for window gardens:
Asparagus plumosus.
Asparagus Sprengeri.
Ground Ivy, *Nepeta Glechoma.*
Honeybell, *Mahernia verticillata.*
Kenilworth Ivy, *Linaria Cymbalaria.*
Moneywort, *Lysimachia nummularia.*
Periwinkle, *Vinca major.*
Smilax, *Asparagus medeoloides.*
Wandering Jew, *Zebrina pendula.*
White Cup, *Nierembergia rivularis.*

Ten bulbs for window gardens:
Begonia, tuberous.
Crocus spp.
Cyclamen Latifolium.
Freesia spp.
Hyacinth, *Hyacinthus* spp.
Iris, Spanish, *Iris Xiphium.*
Narcissus, Chinese, *Narcissus Tazetta* var.
Narcissus, Paperwhite, *Narcissus Tazetta* var.
Oxalis spp.
Tulip, *Tulipa* spp.

Ten window plants for hanging baskets:
Artillery-plant, *Pilea serpyllifolia.*
Alyssum spp.
Centaurea spp.
Cerastium tomentosum.
Dracæna terminalis.
Lobelia Erinus.
Maurandia Barclaiana.
Nasturtium, Dwarf, *Tropæolum* spp.
Periwinkle, *Vinca major.*
Wandering Jew, *Zebrina pendula*

GREENHOUSE PLANTS (See Chapter XII)

Ten flowering greenhouse plants:
Azalea Indica.
Bouvardia spp.
Cereus grandiflorus.
Erica spp.
Hibiscus, Chinese, *Hibiscus Rosa-Sinensis.*
Hydrangea hortensis.
Ipomæa Horsfalliæ.
Olive, Fragrant, *Osmanthus (Olea) fragrans.*
Piqueria (Stevia) trinerva.
Stephanotis floribunda.

Ten plants suitable for coldframes:
Anemone spp.
Daisy, *Bellis perennis.*
"Dutch Bulbs"
Forget-me-not, *Myosotis palustri*
Mignonette, *Reseda* spp.
Pansy, *Viola tricolor.*
Pea, Sweet, *Lathyrus odoratus.*
Polyanthus, *Primula elatior.*
Stocks, *Matthiola incana* var. *annua.*
Violet, *Viola odorata.*

Six tender shrubs to be stored over winter in pits or cellars:
Azaleas, for May bloom.
Genista, *Cytisus Canariensis.*
Poinsettia, *Euphorbia pulcherima.*
Star Jasmine, *Trachelospermum jasminoides.*

Ten plants that may be started in a hotbed for early spring flowers:
Ageratum, *Ageratum conyzoides.*
Alyssum, Sweet, *Alyssum maritimum.*
California Poppy, *Eschscholzia Californica.*
Candytuft, *Iberis* spp.
Clarkia elegans.

Plants started in a hotbed—*Continued*
Godetia, *Œnothera* spp.
Marigold, *Tagetes* spp.
Nasturtium, Dwarf, *Tropæolum* spp.
Nemophila spp.
Stock, Ten Weeks, *Matthiola incana*, var. *annua.*

Ten bulbs for the greenhouse:
Agapanthus spp.
Amaryllis spp.
Crinum spp.
Dioscorea spp.
Easter Lily, Bermuda, *Lilium longiflorum*, var. *eximium.*
Gloxinia spp.
Ixia spp.
Nerine spp.
Richardia spp.
Tuberose, *Polianthes tuberosa.*

Ten foliage plants for the greenhouse:
Araucaria excelsa.
Aspidistra lurida, var. *variegata.*
Croton (*Codæium*) spp.
Dracæna marginata.
Dieffenbachia spp.
Elephant's Ear, *Colocasia antiquorum.*
Jacobina magnifica.
Pandanus utilis.
Phœnix dactylifera.
Rubber Plant, *Ficus elastica.*

Ten vines for the greenhouse:
Allamanda Hendersoni.
Bougainvillea glabra var. *Sanderiana.*
Cissus discolor.
Clerodendron Thompsonæ.
Hoya carnosa.
Lapageria rosea.
Passiflora racemosa.
Plumbago capensis.
Solanum jasminoides.
Thunbergia laurifolia.

PLANTS FOR FORMAL GARDENING

(See Chapter XV)

Ten bedding plants for subtropical effects:
Acalypha marginata.
Arundo Donax.
Canna spp.
Castor-bean, *Ricinus communis.*
Croton (*Codiæum*) spp.
Elephant's Ear, *Colocasia antiquorum.*
Grevillea robusta.
Miscanthus Sinensis, var. *zebrinus.*
Pampas Grass, *Cortaderia argentea.*
Pandanus utilis.

Ten shrubs and trees, etc., grown in tubs for porch decoration:
Bay, *Laurus nobilis.*
Century-plant, *Agave Americana.*
Hydrangea hortensis, var. *Otaska.*
Livistonia Sinensis.
Oleander, *Nerium oleander.*
Pandanus utilis.
Pandanus Veitchii.
Phœnix spp.
Privet, *Ligustrum* spp.
Rhapis flabelliformis.

Ten plants for roof-gardens, etc.:
Areca spp.
Aspidistra.
Begonia rex.
Caladium spp.
Cocos Weddelliana.
Dracæna spp.
Kentia spp.
Pandanus spp.
Sanseveria Zeylanica.
Vinca spp.

Ten plants for vases:
Achyranthes spp.
Centaurea Cineraria.
Coleus spp.
Cordyline indivisa.
Geranium, *Pelargonium* spp.
Helichrysum petiolatum.
Lobelia Erinus.
Nasturtium, *Tropæolum* spp.
Periwinkle, *Vinca* spp.
Senecio mikanioides.

Bedding plants for carpet bedding:

Red foilage:
Acalypha tricolor.
Iresine Lindeni.
Alternanthera amœna spectabilis.
Alternanthera versicolor.

Yellow foliage:
Iresine aurea reticulata.
Alternanthera aurea nana.
Coleus, golden.
Pyrethrum parthenifolium aureum.

Whitish foliage:
Centaurea gymnocarpa.
Cineraria maritima.
Echeveria secunda glauca.
Geranium, *Pelargonium* spp.

Height less than one foot:
Alternanthera paronychioides.
Cineraria maritima.
Echeveria metallica.
Oxalis tropæloides.

Height from one to two feet:
Acalypha marginata.
Centaurea.
Coleus Verschaffeltii.
Pyrethrum parthenifolium aureum.

Blue flowers:
Ageratum conyzoides.
Heliotrope, *Heliotropium* spp.

Bedding plants—*Continued*

White flowers:

- *Ageratum conyzoides.*
- Alyssum, Sweet, *Alyssum maritimum.*
- *Phlox Drummondii.*
- *Verbena* spp.

Red flowers:

- *Begonia Vernon.*
- *Cuphea tricolor.*
- *Phlox Drummondii.*
- *Salvia splendens.*

PLANTS FROM JAPAN

(See Chapter XVI)

Comparatively few people can afford a "Japanese garden," but no one need deprive himself of a "Japanese corner" or "Japanese border" in which the most interesting plants of Japan may be grown by themselves according to American floricultural methods. No equal area in the world furnishes so large a list of desirable ornamental plants as Japan.

Ten of the flowers most popular in Japan:

- Apricot, Japanese, *Prunus Mume.*
- Cherry, *Prunus Pseudo-Cerasus.*
- *Chrysanthemum* spp.
- Iris, Japanese, *Iris lævigata.*
- Lily, Japanese, *Lilium auratum.*
- Maple (autumn leaves considered as "flowers").
- Morning-glory, *Ipomœa* spp.
- Peony, *Pæonia* spp.
- Plum, Japanese, *Prunus triflora.*
- Quince, Japanese, *Cydonia Japonica.*

Six shrubs from Japan:

- *Aucuba Japonica.*
- Bamboo, *Bambusa pygmæa*
- Cherry, Flowering, *Prunus Pseudo-Cerasus.*
- *Fatsia Japonica* (Japanese rice paper plant).
- *Ligustrum Japonicum.*
- *Rhodotypos Kerrioides.*

Twenty perennials from Japan suited for the hardy border:

- *Anemone cernua.*
- *Anemone Japonica.*
- *Aralia cordata.*
- *Aquilegia Buergeriana.*
- *Aster Tataricus.*
- *Astilbe Japonica.*
- *Campanula punctata.*
- *Dicentra spectabilis.*
- *Epimedium macranthum.*
- Eulalia, *Miscanthus* spp.
- *Funkia* spp.
- *Hemerocallis* spp.
- *Iris lævigata.*
- Lily, Japanese, *Lilium auratum.*
- Ophiopogon spp.
- Peony, *Pæonia officinalis.*
- Peony Tree, *Pæonia Moutan.*

Perennials from Japan—*Continued*

- *Petasites Japonica,* var. *gigantea.*
- *Sedum Siebaldii*
- *Thermopsis fabacea.*

Six hardy bulbs from Japan:

- Black Lily, *Fritillaria Camschatcensis.*
- *Lilium speciosum.*
- Lily, Tiger, *Lilium tigrinum.*
- *Lycoris sanguinea.*
- *Lycoris squamigera.*
- *Narcissus Tazetta.*

WILD GARDENS (See Chapter XVII)

Six choice wild flowers and ferns:

- These plants should not be taken from the wild even for garden purposes. If ordered from dealers, be sure they are nursery-grown, not collected.
- All native orchids, especially Lady's-slippers, *Cypripedium* spp.
- Arbutus, Trailing, *Epigæa repens.*
- Fringed Gentian, *Gentiana crinita.*
- Hartford Fern, *Lygodium palmatum.*
- Laurel, Giant, *Rhododendron maximum.*
- Walking Fern, *Camptosorus rhizophyllus.*

Six wild flowers of easy cultivation that bloom in early spring:

- Bloodroot, *Sanguinaria Canadensis.*
- Everlasting, *Antennaria plantaginifolia.*
- *Hepatica triloba.*
- Squirrel Corn, *Dicentra Canadensis.*
- Spring Beauty, *Claytonia Virginica.*
- Wind-flower, *Anemone nemorosa.*

Six robust-growing plants of the class which the beginner should start with:

- Artichoke, Jerusalem, *Helianthus tuberosus.*
- Elder, common, *Sambucus Canadensis.*
- Joe-Pye-weed, *Eupatorium purpureum.*
- Poppy, Plume, *Bocconia cordata.*
- *Rudbeckia laciniata.*
- Teasel, Fuller's, *Dipsacus fullonum.*

Six wild flowers that are easily grown from seed:

- Bloodroot, *Sanguinaria Canadensis.*
- Cardinal Flower, *Lobelia cardinalis.*
- Columbine, *Aquilegia Canadensis.*
- Cone-flower, *Rudbeckia hirta*
- Aster, New England, *Aster Novæ Anglæ.*
- Sunflower, Graceful, *Helianthus orgyalis.*

Six hardy exotic perennials that are easily raised from seed and are suitable for the wild garden:

- *Aquilegia atropurpurea.*
- Larkspur, *Delphinium formosum.*
- Poppy, Iceland, *Papaver nudicaule.*
- Rock-cress, *Arabis albida.*
- Rocket, Sweet, *Hesperis matronalis.*
- Snapdragon, *Antirrhinum majus.*

Six wild flowers that will bloom in April or earlier:

- *Anemone nemorosa* (wind flower).

Wild flowers—*Continued*
- Everlasting, *Antennaria plantaginifolia.*
- Spring Beauty, *Claytonia virginica.*
- *Hepatica triloba.*
- *Sanguinaria Canadensis*, bloodroot.
- Squirrel Corn, *Dicentra Canadensis.*

Six wild flowers that bloom in May:
- Everlasting, *Antennaria plantaginifolia.*
- Columbine, *Aquilegia Canadensis.*
- Jack-in-the-Pulpit, *Arisæma triphyllum.*
- Sweet-william, wild, *Phlox maculata.*
- Wake Robin, *Trillium grandiflorum.*
- Yellow Water Crowfoot, *Ranunculus multifidus.*

Six wild flowers that bloom in June:
- Common Elder, *Sambucus Canadensis.*
- Coneflower, *Rudbeckia hirta.*
- Fragrant Balm, *Monarda didyma.*
- Great Solomon's Seal *Polygonatum giganteum.*
- Shooting-star, *Dodecatheon Meadia.*
- Tall Buttercup, *Ranunculus acris.*

Six wild flowers that bloom in July:
- Adam's Needle, *Yucca filamentosa.*
- Bouncing Bet, *Saponaria officinalis.*
- Butterweed, *Erigeron Canadensis.*
- Cone-flower, *Rudbeckia speciosa.*
- Monkey-flower *Mimulus tigrinus.*
- Purple Cone-flower, *Echinacea purpurea.*
- Virgin's Bower, *Clematis Virginiana.*

Six wild flowers that bloom in August:
- Buttonbush, *Cephalanthus occidentalis.*

Wild flowers—*Continued*
- Cone-flower, *Rudbeckia laciniata.*
- Elecampane, *Inula Helenium.*
- Fuller's Teasel, *Dipsacus fullonum.*
- Great Lobelia, *Lobelia syphilitica.*
- Joe-Pye-weed, *Eupatorium purpureum.*

Six wild flowers that bloom in September:
- Blazing-star, *Liatris squarrosa.*
- Boneset, *Eupatorium perfoliatum.*
- Cardinal Flower, *Lobelia cardinalis.*
- Cone-flower, *Rudbeckia triloba.*
- Poppy, Plume, *Bocconia cordata.*
- Trumpet-creeper, *Tecoma radicans.*

Six wild flowers that bloom in October:
- Daisy Fleabane, *Erigeron strigosus.*
- Golden Aster, *Chrysopsis graminifolia.*
- Goldenrod (*Solidago* spp.).
- Starwort, *Aster* spp.
- Sunflower, *Helianthus*
- Swamp-flower, *Helianthus angustifolius.*
- Witch-hazel, *Hamamelis.*

Six attractive wild flowers, in bark, berries, etc., from November to spring:
- *Celastrus scandens.*
- Laurel, Giant Holly, *Ilex. Rhododendron maximum.*
- Red-branched Dogwood (*Cornus stolonifera*).
- Spindle Tree (*Euonymus*).
- Thorns, *Cratægus*, various red-fruited spp.

ROSES (For lists, See Chapter XVIII)

APPENDIX II

HOW TO GROW FLOWERS

Brief directions for cultivating one hundred and fifty of the commonest and most desirable flowers, mostly annuals and perennials.

By M. G. KAINS

APPENDIX II

Abutilon. See Flowering Maple.

Aconite, Winter. Plant the bulbs about two inches deep in any garden soil in mid-autumn and do not disturb unless they are desired in new quarters. Then, after the foliage has turned yellow, dig, dry in the shade, clean, and store in a dry, airy room until planting time.

Adam's Needle. See Yucca.

Ageratum. Sow seeds in greenhouse or hotbed, and when about two inches high transplant six inches apart; or, for later bloom, sow in the garden when the soil becomes warm. For winter bloom, sow in August. Will grow in any good garden soil.

Ajuga. See Bugleweed.

Alyssum, Sweet. Sow seeds in greenhouse or hotbed in spring and transplant when two inches high to any garden soil; for later bloom sow in garden when soil becomes warm. For winter, sow in August. Also readily propagated by cuttings of young shoots placed in sandy shaded soil. Divisions and layers also may be made.

Amaranth. Cultivate like Prince's-feather, which see.

Anemone. Plant tuberous species in the hardy border in mid-autumn and the other species in rockeries, etc., choosing a well-drained, fairly rich sandy loam if possible. The plants may be divided in autumn or spring when the clumps have become weedy or too large for their quarters. For indoor blooming in winter the tubers may be potted from September to October and managed like hyacinths or tulips. By judicious management a succession of bloom may be obtained from January until the outdoor clumps commence to blossom in the spring.

Anthemis. See Marguerite, Golden.

Antirrhinum. See Snapdragon.

Apios. See Ground-nut.

Aquilegia. See Columbine.

Arabis. See Cress, Rock.

Arundo. See Reed, Giant.

Asparagus (*A. Sprengeri*). Plant seeds in ordinary potting soil at any time during the winter, transplant the seedlings when large enough to small pots, and keep them growing vigorously in frequently changed larger pots, or while small place in hanging baskets, along the edges of benches, etc. May be propagated by division. Does best in a moderately cool greenhouse or room. Very easily managed. The red berries are beautiful, but they sap the strength of a plant. If the green plant is preferred, pick off the young berries.

Aster, China. For earliest bloom sow the seed in a coldframe in autumn, and protect the plants until the ground can be worked in the spring, when they may be transplanted about a foot apart. These should blossom in late spring or early summer. A successional sowing may be made under glass in the winter, and the plants set in the garden when danger of frost has passed. Usually, however, the seed is sown in a coldframe in early spring, and the plants, when about three or four inches tall, transferred to the garden in late spring. These will blossom in late summer. Asters thrive best in rich soil.

Asters, Native. Sow the seeds in a coldframe in early spring, and when the plants are about three inches tall transplant about eighteen inches apart in clumps. Established clumps may be divided in autumn and the pieces reset. Greenwood cuttings root readily.

Aubrietia. Sow seeds where the plants are to remain and thin to about six inches. When once established, further propagation may be made by means of cuttings or layers.

Baby's Breath (*Gypsophila*). Sow seeds in early spring in a mild hotbed or greenhouse; transplant the seedlings when about two inches tall to small pots, and again to any garden soil when the weather becomes settled. For winter bloom, seeds may be sown in late summer, when cuttings or layers of the perennial species may also be made.

Bachelor's-buttons (*Ranunculus acris*, var. *flore pleno*). Sow seeds in mild hotbed or greenhouse in early spring; transplant the seedlings to small pots when about two inches tall, and when the weather becomes settled transplant to good soil in the garden. After once becoming established, the clumps may be divided in spring. See also Globe-flower, Cornflower.

Balloon-vine (*Cardiospermum*). After danger of frost has passed, sow in ordinary garden soil and provide a wire trellis from five to ten feet high, according to the quality of the soil.

Balm, Fragrant (*Monarda didyma*). Sow seeds in spring and transplant to permanent quarters when the plants become large enough. A moist rich situation is most favorable.

Plant in masses for distant observation, since the flowers are rather unkempt. Divide frequently, because the plants spread rapidly from their underground stems.

BALSAM (*Impatiens*). Sow seed in mild hotbed in early spring or when spring opens in the garden. Transplant the seedlings when about two inches high, the early ones to small pots, the later ones to the beds, which should be good garden soil in sunny places. For winter, cuttings may be made in late summer or early autumn and the plants kept in rather warm quarters. Cuttings may also be made of the greenhouse plants for outdoor use.

BARTONIA. See POPPY, MEXICAN.

BEAN, HYACINTH (*Dolichos*). Sow like morning-glory (which see), but provide a taller and stronger trellis, since the twining vines often grow more than fifteen feet.

BEARD-TONGUE (*Pentstemon*). Sow seeds in a mild hotbed or greenhouse in early spring; transplant to flats or small pots, and when the weather becomes settled set in the garden. Some species do best in partial shade, but most can stand the sun. All need moist soil, but are not partial to quality of soil. Many are grown as annuals, but the perennial kinds may be propagated by division.

BEE-BALM. See BALM, FRAGRANT.

BEGONIA (shrubby or fibrous-rooted kinds). Easily grown from cuttings of firm green wood, which, when rooted, may be planted in ordinary potting soil. Frequent changes of pots and additions of fresh soil are necessary, and so are light and fresh air. Cuttings taken in February and kept growing vigorously should become fine plants by the following winter, during the latter part of which they should blossom freely.

BLAZING-STAR (*Liatris*). Plant seeds in ordinary soil in the autumn, and in the spring thin or transplant the seedlings to stand from one to two feet apart, according to variety. Though doing best upon good soil, the plants will yield well upon soil too poor for most garden flowers. When once established, they may be increased by means of offsets. See also MONTBRETIA.

BLEEDING-HEART (*Dicentra*). Plant roots when the ground can be worked in spring, choosing rather good soil. The plants do well for years without further attention than an annual manuring and the removal of weeds.

BLUEBELLS (*Mertensia*). Sow seed as soon as ripe, where the plants are to remain in rich loamy soil sheltered from the wind, but exposed to the sun. Do not disturb. Leaves die after the plants flower. Plants do not propagate well by division.

BLUEBOTTLE. See CORNFLOWER.

BLUET. See CORNFLOWER.

BOCCONIA. See POPPY, PLUME.

BUGBANE (*Cimicifuga*). Sow seeds in fall or spring where the plants are to stand, choosing the rear of borders and places where the bad smell of the plants will not be noticed, and where the attractive foliage and flowers will show off well. Thin the plants to stand from two to four feet apart. Established plants may be divided in fall or spring.

BUGLEWEED. Easily propagated by division or by seeds. *Ajuga reptans* succeeds well in shady places, but may spread too fast.

BULBOCODIUM. Plant the bulbs in early autumn, choosing rather light, fairly rich soil and sinking the bulbs two inches deep. Allow the foliage to die naturally each spring after flowering. Every second or third year dig up, clean, store in a cool, airy place until planting time. Does well in lawns, since the foliage usually dies before the lawn needs mowing. It should bloom a week before the crocuses.

BURNING-BUSH. See GAS-PLANT.

BUTTERFLY-FLOWER (*Schizanthus*). Sow seeds in a mild hotbed or greenhouse in early spring, transplant the seedlings when about two inches tall to small pots, and when the weather becomes settled place in the garden in any good soil. They may also be sown in the open ground if desired. Allow about a foot between plants. For winter bloom sow seed in midsummer and transplant frequently as the plants need more pot space. They should flower from mid-winter till spring.

BUTTERFLY PEA. See CENTROSEMA.

CALADIUM. See ELEPHANT'S EAR.

CALCEOLARIA. The hybrid kinds may be grown from seed sown in the greenhouse in late winter, the seedlings being transferred to pots as soon as they are large enough to handle, and set in rather shady locations when the weather becomes settled. The plants are usually grown as greenhouse specimens, the seeds being sown in midsummer in partial shade. For best results they should receive no check, but be given rather frequent changes of pots until near flowering time, when they may be allowed to become pot-bound.

CALLIOPSIS. A popular name for certain kinds of Coreopsis, which see.

CALLIRHOE. See POPPY-MALLOW.

CAMPION. See LYCHNIS.

CANDYTUFT, Annual (*Alyssum*). Sow seeds in greenhouse or hotbed, and when about two inches high transplant from six to twelve inches apart in good garden soil; for later blossoms sow when the soil becomes warm; for winter, sow in August. Biennial and perennial species and varieties are also propagated as above, but the latter are more frequently reproduced by stem cuttings in the greenhouse or by division.

CANNA File holes in the seeds and soak them in warm water for about a day before sowing singly in pots under glass in late winter. When six or eight inches tall, transplant from two to six feet apart in any soil, light and rich preferred. In autumn dig up the clumps, dry them for a few days in an open shed, and store in a warm, dry, airy cellar. During winter divide the clumps of desirable seedlings or of named varieties, allowing at least one eye to each piece, and plant in pots for transplanting to the garden in late spring. These give earliest effects. The divisions or the whole clumps may be set direct in the garden, but are later in producing effects.

CARDINAL FLOWER (*Lobelia cardinalis*). Sow seeds under glass in late winter, and when a few inches tall transplant to moist soil, especially on the borders of marshes and streams. When once established they will continue from year to year. Strong plants may be divided; and vigorous, stocky shoots may be used for greenwood cuttings. When used in beds and borders, the plants should stand at least eighteen inches apart.

CARDIOSPERMUM. See BALLOON-VINE.

CASTOR-OIL BEAN. Start seed in hotbed singly in pots and transplant from four to ten feet apart, when about six inches tall, after danger of frost has past, or sow direct in garden when soil becomes warm. Dry, rich, deep soil is best.

CATANANCHE. Sow seeds in a mild hotbed or greenhouse in early spring, transplant the seedlings when about two inches tall, and again to the garden when the weather becomes settled. Seeds may also be planted where the plants are to remain. Allow about eighteen inches between plants. They do well in light soil.

CELOSIA. See COCKSCOMB.

CENTROSEMA. Sow seed in early spring, choosing sandy soil where the plants are to remain. Provide a wire trellis upon which the vines may twine five or six feet.

CHAMOMILE. See MARGUERITE, GOLDEN.

CHIONODOXA. See GLORY OF THE SNOW.

CHRYSANTHEMUM (*C. coronarium*). Sow the seed in a hotbed in early spring, and when a few inches tall transplant about twelve inches apart in ordinary soil. A later sowing may be made where the plants are to stand in the garden, the excess being weeded out. Judicious pinching back tends to make the plants more shapely.

CIMICIFUGA. See BUGBANE.

CLARKIA. For earliest bloom where winters are mild sow seeds in early autumn; for next early, sow in earliest spring, and for succession sow when ground has become warm. When about three inches tall transplant about twelve inches apart in any soil.

CLEMATIS. Set nursery-grown plants in rich, light loam, provide trellis for the climbing kinds, give annual applications of manure, and mulch with litter during winter. Often the native species may be obtained in the woods. Small plants should be selected in such cases. Do not take them if they are rare in your neighbourhood.

CANTERBURY BELLS. Sow seed in greenhouse or hotbed in early spring; transplant the seedlings as they need it and set in the open ground after the weather has become settled, allowing two feet apart in ordinarily good soil. They may be expected to produce some blossoms the first season, but are more prolific in the following year. They are often sown in the open ground, but in this case do not usually blossom until the second season.

COBŒA SCANDENS. Sow the seed in late winter and water sparingly till germination is complete; transplant the seedlings when about two inches tall to small pots and set them in the open after danger of frost has passed. Provide a twenty-foot wire trellis. Greenwood cuttings in sandy soil and gentle heat may be taken from plants growing in the greenhouse.

COCKSCOMB (*Celosia*). Sow seed in early spring in a mild hotbed or greenhouse; transplant the seedlings when about two inches tall to small pots or flats, and when danger of frost has passed set in the garden from six to eighteen inches apart according to variety. If the plants ever suffer for want of water, they will drop their leaves. Plant in light, rich, deep, moist soil. For winter bloom sow in late summer.

COLEUS. Take cuttings from garden-grown plants before danger of frost. When they have struck root, which they do readily, plant in good potting soil in small pots and shift to larger ones as the plants require room. They do best and have the most brilliant colours in bright sunlight and warm rooms or greenhouses. For outdoor planting the cuttings are rooted in midwinter and the plants brought forward to three- or four-inch pots, from which they are set in the open ground about a foot apart for the smaller kinds and eighteen inches for the larger. In a moderately rich sandy loam well-exposed to the sun the plants develop the most brilliant colours. In very rich soil they grow larger, but lack brilliancy.

COLCHICUM. Plant bulbs three inches deep in late summer or early autumn in light, deep, rich sandy loam and give a mulch of leaves or litter, which should be raked off in spring. The autumn species make their foliage in spring and bloom without leaves in August and September. They should remain undisturbed until the flowers and foliage show signs of failing. Then, after the foliage has died down, they may be dug, divided, and planted in new ground at the proper season.

The spring-blooming kinds may be planted like snowdrops in lawns. Both spring and autumn blooming species do well in rockeries.

COLUMBINE (*Aquilegia*). Sow seeds in midwinter and transplant when the seedlings are large enough, using small pots or flats. These plants, if kept growing vigorously, should blossom the first season. Plant in any soil, among rocks, or in borders exposed to the sun, but sheltered from wind. Further propagation is easily effected by division—the only safe way to secure plants like the parents if more than one species or variety is growing in the neighbourhood.

CONE-FLOWER. See RUDBECKIA.

CORAL BELLS (*Heuchera sanguinea*). Sow seeds in early spring in a hotbed or mild greenhouse, transplant the seedlings to small pots when about two inches tall, and again to ordinary garden soil, about one foot apart, when the weather becomes settled. Later sowings may be made in the open ground. If grown as a perennial, the clumps may be divided in spring when the ground becomes warm. Cuttings may be made for winter use in late summer and for summer use in late winter.

COREOPSIS. Sow the seed in a hotbed in early spring or in the open ground for later bloom, and, when a few inches tall, transplant about two feet apart in ordinary garden soil. The perennial varieties may be propagated by greenwood cuttings taken in summer and set in a coldframe or by division of the clumps in autumn or spring.

CORN-FLOWER (*Centaurea Cyanus*). Sow seed where the plants are to remain and thin to about eighteen inches. Any soil will suit. The plants self-sow.

COSMOS. Sow the seed in a mild hotbed or greenhouse in early spring; transplant the seedlings when large enough to handle and as often thereafter as they need, and set in the open ground when the season has become settled, choosing rather poor soil and fairly sunny situations protected from wind. On rich soil they grow spindling and produce fewer and inferior blossoms later in the season than those on poorer soil. Pinching out the leading shoots of the young plants helps to make them stockier and more prolific.

COTTON (*Gossypium*). Sow seeds in a mild greenhouse or hotbed in late winter or early spring. Transplant to small pots and perhaps again before the weather becomes settled, when the plants may be set in the garden about two feet apart mainly to form backgrounds for smaller growing plants.

COWSLIP, AMERICAN. See SHOOTING-STAR.

COWSLIP, VIRGINIA. See BLUEBELLS.

CRAMBE (*C. cordifolia*). Sow seeds in ordinary soil where the plants are to remain or in a separate bed from which to be transplanted. Allow three or more feet between plants. If desired, start in a hotbed or greenhouse and transplant to pots or flats while the plants are small. The flowers are rarely produced before the third year, after which the plants fail. During the first two years the foliage is ornamental. Plant annually for succession.

CRESS, ROCK (*Arabis*). Sow seeds in early spring where the plants are to remain and then to about four inches. They thrive well in poor soil, but require plenty of sun. The perennial kinds are usually propagated by division. Cuttings root readily. See also AUBRIETIA, which is sometimes called Rockcress.

CROCUS. Plant bulbs in early autumn about three inches deep in a sunny situation and well-drained, rather light, fairly rich soil. After the foliage has turned yellow, dig up the bulbs, dry them in the shade, clean and store them until planting time. If planting be delayed, the bulbs will start to grow. They may be allowed to remain in the ground two years without damage, but if three or more years they are likely to push out of the ground.

CROCUS, AUTUMN. See COLCHICUM.

CROWN IMPERIAL. See FRITILLARIA.

CYCLAMEN. Sow seeds in December or January, and, as the little plants become large enough to handle, transplant them to small pots or to flats, in which they must be kept growing vigorously. As they need more space, plant them singly in pots, using a light, fairly rich potting soil. When the weather becomes settled, transfer the pots to a partially shaded location out of doors, plunging the pots almost to their rims in a well-drained soil. By September the plants should be in five-inch or six-inch pots, in which they are to flower. About fifteen months must elapse from planting the seed before the flowers appear. Only vigorously growing plants should be kept; the slow ones are not worth saving. Bulbs obtained from seedsmen are frequently unsatisfactory because they have become dried.

CUP AND SAUCER. See CANTERBURY BELLS.

CYPRESS-VINE (*Ipomœa Quamoclit*). Sow the seeds in early spring where the plants are to remain, choosing good garden soil and a rather sunny exposure. Thin the plants to about eight inches; provide upright wire or string trellis ten feet or more high for the plants to twine upon.

DAFFODIL. Plant the bulbs three or four inches deep in autumn in good garden soil and in partial shade. Each bulb will produce a clump of bulbs in the course of three or four years, when, after the foliage has died down, they should be dug up, divided, and replanted. The clumps are often allowed to remain longer, but the production of flowers is reduced on account of the crowding.

Dahlia. The tubers may be planted in early spring in rather rich soil, but by starting them in a coldframe or a spent hotbed and transplanting to permanent quarters after danger of frost has passed, the blossoms may be obtained much earlier. Better still, by obtaining cuttings from the stems sent up by tubers started in the greenhouse in winter, potted plants may be set in the garden and brought into bloom several weeks in advance of those obtained by the first method. In autumn, a week after the tops have been killed by frost the tubers should be dug, dried, and stored in a cool, dry, airy, dark place until needed. They may be divided with a sharp knife, care being taken to have at least one bud upon the stem end of the tuber. The larger plants should stand three feet apart and have stakes, the smaller two feet or even less.

Daisy, English (*Bellis*). Sow the seeds in early spring, and when the plants are about two inches tall transplant about eight inches apart in rich, cool, moist soil partially shaded. After the plants have flowered they may be divided, division being indicated by the various crowns, each of which should have some roots attached to it.

Daisy, Michaelmas. See Asters, native.

Daisy, Swan River (*Brachycome*). Sow the seeds in early spring in gentle heat, and when about two inches tall transplant about six inches apart in good soil. Sowings made in the open ground when the soil becomes warm may be made for succession.

Dame's Violet. See Rocket, Sweet.

Day Lily. See Funkia.

Delphinium. See Larkspur.

Dianthus. Sow seeds in early spring under glass, transplant the seedlings when they are large enough to handle, using flats or small pots. When the weather has become settled, set in the garden from a foot to eighteen inches apart according to variety. The perennial kinds may be divided in spring. Any good garden soil suits them.

Dicentra. See Bleeding-heart.

Dictamnus. See Gas-plant.

Dodecatheon. See Shooting-star.

Dolichos. For *D. Japonicus* see Pueraria. For *D. Lablab*, see Bean, Hyacinth.

Doronicum. See Leopard's Bane.

Elecampane (*Inula grandiflora*). Sow seed in spring in any good soil well exposed to the sun, or divide clumps.

Elephant's Ear (*Colocasia*). Plant the tubers in a mild hotbed or greenhouse in late winter, and when the weather has become settled transplant to summer quarters, allowing three feet or more between the larger growing kinds. Select damp, rich ground or keep the ground moist by weekly *Drenchings*. At the approach of cold weather, dig up the plants and store in a dry, airy frost-proof place.

Elymus. Sow the seeds where the plants are to remain and thin out to four feet or more. The clumps may be divided after the second year or before, if they make a very vigorous growth.

Eschscholzia. See Poppy, California.

Eulalia. See Miscanthus.

Evening-Glory. Same as Moonflower, which see.

Fairy Lily. See Zephyranthes.

Flag. See Iris.

Flameflower (*Kniphofia or Tritoma*). Plant roots in spring in warm, well-drained soil protected from the wind. Allow two feet or more between plants. In autumn dig and store in a dry, airy, frost-proof cellar. From Washington southward the plants may be left out during the winter if protected somewhat with leaves or litter.

Flax, Flowering. Sow seeds where the plants are to remain in ordinary garden soil well exposed to the sun. Thin to six or eight inches. Plant successionally for later blooming.

Flowering Maple (*Abutilon*). May be propagated by seeds. Greenwood cuttings, which may be taken at any time, are more often used. The plants succeed under the same general treatment as geraniums and fuchsias.

Forget-me-not (*Myosotis*). Plant seeds in spring in moist, partially shaded places, preferably where the plants are to remain. Thin the plants to stand four inches apart, and during the summer thin out the smaller ones, leaving the large ones eight inches or a foot apart. These will flower the following spring and will re-seed abundantly. The plants will stand even stiff clay and full sunlight.

Foxglove. Most varieties can be treated the same way as Canterbury Bells, which see. The perennial sorts may be started in this way and after their establishment may be divided. They will succeed in sunny or partially shaded places and seem to prefer light, rather rich, friable, moist soil.

Fraxinella. See Gas-plant.

Freesia. Plant the bulbs in autumn in ordinary potting soil and keep in a cold place until desired for successional blooming, when they may be brought into the mild greenhouse. Provide ample drainage in the pots or flats and water sparingly until blossoming time. After growth starts, the plants require about six weeks until the blossoms appear. The bulbs may be dried off like other species of bulbous plants, but new ones are usually so much more floriferous and are so cheap that they are generally preferred.

Fritillaria. In early autumn plant the

bulbs four inches deep in rich, moist, but well-drained, sandy loam, allowing from a foot to eighteen inches between bulbs. The beds should be out of the direct rays of the sun, either shaded by trees or shrubs during the heat of the day or planted on a northern exposure. Since the bulbs form numerous offsets they should be dug every second or third year after the foliage has died down. After cleaning and dividing the clumps, store in a cool, airy, dry place until planting time.

FUCHSIA. Blooming plants may be grown from seed in about a year. Cuttings are more frequently used, since they are always obtainable and are very easy to root. The plants will do well in any soil and in the ordinary temperature of the living-room. Cuttings rooted in early spring should produce blossoming plants by Thanksgiving Day, and cuttings taken in September should bloom before spring. After blooming, the plants are generally thrown away, but they may be made to bloom again after a rest, during which the plants must be kept in cool quarters and watered sparingly.

FUNKIA. Plant roots in deep, rich, moist soil in spring. The large-leaved kinds do best in partial shade, where the soil is very moist. The plants may be allowed to remain for years, during which time they generally improve. Some species produce seed freely. If seedlings are needed, the seed should be sown as soon as ripe.

GAILLARDIA. Sow the seeds in midwinter under glass, and when about an inch tall transplant to two-inch pots and, if necessary, to a larger size before transplanting in the garden, where they should stand about fifteen inches apart in light, rich soil in an open, sunny situation. The seeds are very slow to germinate.

GALANTHUS. See SNOWDROP.

GALTONIA. See HYACINTH, SUMMER.

GAS-PLANT (*Dictamnus*). Sow seeds as soon as ripe in the autumn, covering them an inch deep in a nursery bed, where the plants may remain until two years old. The seedlings should be thinned to six inches in the row and be undisturbed, since they do not bear transplanting well. Select for permanent quarters a fairly rich, rather heavy soil, and a situation in which the plants may remain undisturbed.

GERANIUM. Transplant plants from the garden in autumn, allowing plenty of room in the pot, saving as much root as possible and cutting back the top severely. The firm green parts removed may be used as cuttings. They easily strike root and are of easiest management. They need only ordinary soil, and if kept growing vigorously should bloom for months. A greater amount of bloom is produced by allowing the plants to become pot-bound after they have reached blooming age. Plants which have been grown from cuttings taken in winter, and which are in three or four-inch pots, may be set in the garden after danger of frost has passed. Allow nine inches for the smallest bedding varieties and eighteen inches for the large ones.

GILIA. Sow the seed in the autumn where the plants are to remain, because they do not bear transplanting well, unless the operation is done while the plants are very small. The bed should be covered with a light mulch of leaves or straw, which must be removed in spring. They do best in rather light soil, and, according to kind, should stand from six to twelve inches apart.

GILLIFLOWER. See STOCK.

GLADIOLUS. Plant the corms two inches deep in heavy soils and four inches in light. Successional planting should commence with the smallest corms as soon as the soil can be worked, and end with large corms planted about midsummer. If confined to beds, the first-planted bulbs may be set twelve inches apart, the later-planted ones set in the intervals; six inches apart is close enough. In late autumn dig, dry, clean and store the corms in a cool, dark, dry, airy place. Seeds are often used to produce new varieties. They are sown thickly in spring, a few radish or turnip seeds being planted with them to mark the rows. No flowers can be expected the first season from seeds. Even the second season some corms will fail. These should be saved for a third year's planting, because they often produce superior flowers.

GLOBEFLOWER (*Trollius*). Sow in a mild hotbed or greenhouse in early spring; transplant to small pots or flats when about two inches tall, and when the weather becomes settled set in ordinary garden soil in a sunny place. Seed may also be planted where the plants are to remain. Allow about a foot between plants.

GLORY OF THE SNOW (*Chionodoxa*). Plant the bulbs three inches deep in any friable soil that will supply plenty of moisture until the tops have completed their growth. Light is also essential. Dig and divide the plants every third year if in beds, but if in lawns let them die out, which they may be expected to do in a few years more. When conditions are favourable, however, the numerous seeds will replenish the ground. The seeds should be sown in a coldframe in which they should germinate the following winter and produce little bulbs in the spring. These may then be planted where needed or grown another year in nursery beds.

GLOXINIA. For the propagation of choice varieties or colours, cuttings of leaves and stems are employed, the former preferred. Seeds are usually more satisfactory for ordinary purposes. They should be sown during midwinter, carefully watered, transplanted while small and again as they need. The soil used should be light and fibrous and fairly rich. If properly managed they should begin to blossom in early autumn and continue for several weeks. The dying of the leaves indicates the approach of the resting period. Water should then be withheld, the plants being allowed to become dry without shrivelling. At this time the temperature should be kept below fifty degrees. About midwinter the bulbs will commence to grow and the most active may be planted; others later for succession. The old soil and dead roots should be removed before repotting.

GODETIA. Sow in early spring under glass, and when the seedlings are about three inches tall transplant about fifteen inches apart in rather poor soil. In rich soil the plants become rank and produce fewer and poorer flowers. They may also be started in a coldframe or in the open ground, but are later than if transplanted from the greenhouse.

GOLDENROD (*Solidago*). Transplant choice specimens from the fields and fence rows. They respond well to good treatment.

GOMPHRENA. See GLOBEFLOWER.

GRAPE HYACINTH. See HYACINTH, GRAPE.

GREVILLEA. See SILK OAK.

GROUNDNUT, HOG (*Apios tuberosa*). Plant tubers three inches deep in light soil well exposed to the sun. Three or four should be planted together. Provide trellis upon which the vines may twine for eight feet. Dig and divide annually to prevent undue spreading.

GYPSOPHILA. See BABY'S BREATH.

HELIANTHEMUM. See SUN-ROSE.

HELIANTHUS. See SUNFLOWER.

HELICHRYSUM. Sow in any garden soil when the soil becomes warm. Allow from one to two feet between plants. If desired, seeds may be started in a mild hotbed or greenhouse and the seedlings transplanted when about two inches tall, and later to the garden.

HELIOTROPE. Propagate by means of cuttings of terminal shoots in moist sand. Pot the rooted cuttings in light, rich potting soil; provide good drainage, but never let the plants suffer for want of water. Since the plants make rapid root growth, they need frequent changes of pots. For use in the garden, set the plants out after danger of frost has passed, choosing a sunny place and light, rich soil. They should be about thirty inches apart.

HELIPTERUM. Sow seeds in a mild greenhouse or hotbed in early spring; transplant to small pots or flats when about two inches tall and set in ordinary garden soil when the weather becomes settled. Allow about a foot between plants. Seeds may also be sown in the garden when spring has opened.

HELLEBORE. All cultivated like *H. Niger*. See ROSE, CHRISTMAS.

HEMP. Sow seeds in good soil where the plants are to remain and thin out the seedlings to stand about eighteen inches apart. Use only for backgrounds, since the plants are tall growing.

HESPERIS. See ROCKET, SWEET.

HEUCHERA. See CORAL BELLS.

HOLLYHOCK (*Althæa*). Plant the seed in January in a cool greenhouse, using ordinary potting soil. When the seedlings are large enough, pot them singly in small pots and as occasion may demand shift them to larger pots until the weather becomes settled in spring, when they may be planted where they are to remain in the garden. A light, deep, rich soil suits them best, but they will grow in poor soil. Allow three feet between plants. If started thus, flowers may be expected the first season, but if started in the garden they will not flower until the following season. Since they frequently fail to produce well the third year, successional annual sowings should be made.

HOP (*Humulus*). Sow seeds of Japanese annual as soon as the ground becomes warm, choosing deep rich soil. Provide a trellis or strings twelve or more feet high. The perennial hop may be grown similarly from seed or established clumps may be divided in spring.

HOSE IN HOSE. See CANTERBURY BELLS.

HYACINTH. Plant bulbs in autumn, four or five inches deep in ordinary soils, shallower in heavy, deeper in light. Protect in the North with a light mulch of litter or leaves, which must be removed in spring. When leaves have turned yellow, dig up, dry in the shade, clean and store until autumn.

HYACINTH, GRAPE (*Muscari*). Plant the bulbs in any moderately fertile soil during autumn, sinking them about two inches deep. They may be allowed to remain until they show signs of deterioration, when, after the tops have died down, they may be dug, cleaned, dried and replanted at the proper season. The foliage should always be allowed to die naturally, since bloom of the following season depends upon foliage of the present. May be planted in lawns like snowdrops.

HYACINTH, STAR. See ACONITE, WINTER.

HYACINTH, SUMMER (*Galtonia*). In spring plant the bulbs four or more inches deep in rich, moist, but well-drained soil. In the North dig the bulbs after the tops have died, or protect with a mulch of leaves or litter over winter. In favoured situations and warmer regions this latter method gives best results, since the plants do best when undisturbed and allowed to grow in clumps for several years.

ICE-PLANT (*Mesembryanthemum*). Sow seeds in a sunny place in sandy soil as soon as the ground becomes warm in spring. Thin to about six inches. For indoor use sow seeds in midsummer or transplant plants from the garden in autumn before frost. The plants withstand drought well.

INULA. See ELECAMPANE.

IPOMŒA. See MORNING-GLORY; CYPRESS-VINE.

IRIS. Plant the rootstocks or tubers in moist, even wet soil in spring or autumn, and keep the clumps free from weeds. As occasion may demand, divide the clumps. If in very wet places, the division may take place in midsummer, the clumps being removed to a shed and the roots covered with earth until autumn. Propagation may also be effected by means of seed, which must often, however, be obtained by cross fertilisation of the flowers.

JONQUIL. Cultivate like DAFFODIL, which see.

KENILWORTH IVY. Sow seeds in any odd, moist corner of the greenhouse, among taller growing plants, or in partially shaded places out of doors, and let the plants take care of themselves. The outdoor specimens will die during winter, but will resow themselves. They may be readily propagated by division.

KUDZU VINE. See PUERARIA.

LARKSPUR (*Delphinium*). Plant seeds in late winter and keep growing vigorously in several shifts of pots until the weather becomes settled, when the plants may be set in good soil, well exposed to the sun. These should flower the first season. Annual kinds are so propagated. The perennial is started this way, but later propagation is by means of division of the clumps in the spring or by cuttings of young growth taken in spring, or of second growth which appears after flowering. After flowering, the old tops of some species may be cut and a second crop of bloom obtained in the autumn. Seeds may also be sown in autumn where the plants are to remain or for transplanting. The clumps should be divided every third year.

LEOPARD'S BANE (*Doronicum*). Sow seed where the plants are to remain and thin the seedlings to stand about a foot apart. After once becoming established the tubers may be used for further propagation.

LEUCOJUM. See SNOWFLAKE.

LIATRIS. See BLAZING-STAR.

LIGHTNING, SCARLET. See LYCHNIS.

LILY. In well-drained, deeply worked, fairly rich garden loam, plant the bulbs from four to six inches deep. (*L. auratum* ten or twelve inches deep). Mid to late autumn is the best time for planting most species. (*L. candidum* and *L. excelsum* should be planted in August or September.) With the exception of *L. candidum*, which thrives in full sun, lilies do best in the partial shade or shrubbery, trees or buildings, especially if the shade protects the plants during the heat of the day. During winter a liberal mulch of leaves or litter should be given. When the plants seem to need division they should be dug after growth has started in the spring and placed in new quarters (already prepared) as soon as possible.

LILY, CHINESE SACRED. Plant the bulbs in ordinary potting soil as soon as they can be obtained after importation and keep in cold place until needed, when they may be brought into a living-room, provided they have formed roots. They are often grown among stones in water, no soil being used. In this case also good root development must precede the development of the tops. The bulbs should, therefore, be kept in a dark, cool place, as above indicated.

LILY, DAY. See FUNKIA.

LILY, FAIRY. See ZEPHYRANTHES.

MAPLE, FLOWERING. See FLOWERING MAPLE.

LILY-OF-THE-VALLEY (*Convallaria*). Plant the pips in late autumn in a partially shaded good, light garden loam, where the plants may be allowed to spread. No further attention except ordinary manuring is necessary. Dividing and transplanting may be done in autumn or early spring.

LINUM. See FLAX, FLOWERING.

LOBELIA (*L. Erinus*). Sow seeds during winter in the greenhouse; when about two inches tall transplant to flats or small pots, and when the ground becomes warm transplant from four to six inches apart in rather rich soil in a sunny situation. For later bloom, sow in early spring where the plants are to remain and thin out the excess. They respond to stimulating manures with improved flowers. See also CARDINAL FLOWER.

LUNGWORT, VIRGINIA. See BLUEBELLS.

LYCHNIS. Sow seeds in any soil in early spring or start under glass. Set the plants about a foot apart. Perennial species may be divided.

LYME-GRASS. See ELYMUS.

MALTESE CROSS. See LYCHNIS.

MARGUERITE, GOLDEN, CHAMOMILE. Plant seeds in a mild hotbed or greenhouse, or in the open ground. Transplant while small to pots or permanent quarters in ordinary soil. Allow from eighteen to twenty-four inches between plants. Select sunny place.

MARIGOLD (*Tagetes*). Sow the seeds in a coldframe in late winter or early spring, and when about three inches tall transplant to any good garden soil when the soil becomes warm. The African varieties should stand about fifteen inches apart; the French about ten inches; and the dwarf varieties about six inches.

MAURANDIA. Sow seeds in late winter or early spring in a moderately warm hotbed or greenhouse; transplant when two or three leaves are formed, using small pots, and set in good soil when the weather has become settled. Provide trellis about ten feet tall. Cuttings readily take root in the greenhouse.

MEADOW SAFFRON. See COLCHICUM.

MENTZELIA. See POPPY, MEXICAN.

MERTENSIA. See BLUEBELLS.

MESEMBRYANTHEMUM. See ICEPLANT.

MIGNONETTE (*Reseda*). Sow seeds in a mild hotbed in early spring; transplant the seedlings when about two inches tall to small pots or flats, and again to the garden when the ground becomes warm. Later and successional sowings may be made in the open ground. For winter blooming seeds may be sown in midsummer, when cuttings may also be taken. Any garden soil suits them.

MIMULUS. See MONKEY-FLOWER.

MISCANTHUS (same as *Eulalia*). Sow seeds in a mild hotbed or greenhouse in early spring and transplant the seedlings to small pots when about two inches tall. When the weather becomes settled transplant in the open ground in ordinary soil. Allow five feet between plants. Division of the clumps is the usual method of propagation after the plants have become established.

MONARDA. See BALM, FRAGRANT.

MONKEY-FLOWER (*Mimulus*). Sow in the garden as soon as the soil becomes warm, and when about two inches tall transplant about a foot apart in any partially shaded soil. Cuttings readily strike root, and the clumps may be divided.

MONTBRETIA. Plant the bulbs in the spring in any garden soil, rather light preferred, sinking the corms three or four inches deep and eight inches apart. Plant successionally every ten days or two weeks. In autumn dig, clean, divide and store the corms in moist earth. Don't have them wet. Farther south they may be left where they grow with a mulch of leaves or litter as protection. In such cases they should be dug every three years.

MOONFLOWER (*Ipomœa*). File the points of the seeds or cut small notches in them, to hasten and insure germination. Sow in late winter in a moderately warm greenhouse or hotbed. When two or three leaves have appeared transplant the seedlings to small pots, and when danger of frost has passed set in deep, rich soil and provide a straight wire or string trellis twenty to thirty feet tall. Cuttings may be taken in early autumn for winter flowering. The plants are twining.

MORNING-GLORY (*Ipomœa*). Sow seeds as soon as the ground can be worked where the plants are to remain, choosing a warm, sunny place and ordinary soil. Provide straight wire trellis or strings (the plants twine) six or eight inches apart. In ordinary soil the plants should reach ten feet; in rich, much more. In the latter they will usually be less floriferous and later in blooming, but will produce greater shade. They self-sow readily.

MOSS-PINK (*Phlox subulata*). Plant divided plants in any soil among rocks and in borders where a mat of low herbage is desired. The plants will care for themselves with only an autumn dressing of litter or manure.

MOTHER OF THOUSANDS. See KENILWORTH IVY.

MOURNING-BRIDE (*Scabiosa*). Sow seeds in the open ground or in a mild hotbed. Transplant while small to ordinary garden soil, the dwarf varieties about six inches apart and the tall ones as much as two feet. The perennial species may be divided, but some of them act like biennials and should be sown annually. For indoor blooming the seed may be sown in late summer.

MULLEIN-PINK. See LYCHNIS.

MUSCARI. See HYACINTH, GRAPE.

MUSK-PLANT. Cultivate like MONKEY-FLOWER, which see.

MYOSOTIS. See FORGET-ME-NOT.

NARCISSUS, POET'S. Cultivate like DAFFODIL, which see.

NASTURTIUM (*Tropæolum*). Sow the seed singly in two-inch pots in the hotbed or greenhouse in early spring and transplant to poor soil, the dwarf varieties about a foot apart, the tall ones two to four. The seeds may also be sown in the open ground when the soil becomes warm. Choice varieties or colours may be easily propagated by cuttings —the usual way for obtaining plants for winter blooming.

NEMOPHILA. Sow the seed in a coldframe in early spring and transplant while the plants are very small six inches apart in good soil. For earliest bloom the seeds may be sown in early autumn where the plants are to remain, and protected during the winter with a light mulch of leaves or straw. Some of these late-sown plants may be potted and removed to the cool greenhouse for winter blossoming.

NICOTIANA (*N. alata*). Sow seeds in mild hot-bed or greenhouse in early spring or late winter; transplant when about two inches tall to small pots, and when danger of frost has passed set in good garden soil, about two feet apart. From Washington southward the plant often self-sows, and in the South it lives over winter. For winter blooming sow seeds in late summer and give ordinary attention.

PAMPAS GRASS. Since seedlings must usually be two years old before they will flower, division of established clumps in the spring is preferred. The plants thrive best in rich, light, rather moist loam. Since the plants are rather tender in the North, they should be protected during the winter with a mulch of straw or leaves several inches thick and held in place by boards or boughs.

PANSY. For early spring flowering sow in the autumn, and when the plants have three or four leaves transplant about three inches apart in coldframes, which must be protected from inclement weather during winter. In early spring the plants may be set about five inches apart in light, rich soil. They do best in partial shade, especially if flowers are desired during the summer, a season which reduces the size of the blossoms. Spring-sown seed rarely produces as satisfactory plants as autumn-sown.

PEA, PERENNIAL (or EVERLASTING). Sow seeds where the plants are to remain, but avoid placing them in borders with shrubbery, etc. Among rocks, in waste places, and in any kind of soil they will thrive.

PEA, SWEET. For earliest bloom sow the seeds about four inches deep in late autumn where the plants are to remain, choosing a deep, rich, rather heavy loam and a dry situation. Spring successional sowings should commence with the opening of the season, the seeds being sown in trenches from four to six inches deep, but being covered with less than two inches of soil. Thin the seedlings to stand eight inches apart, and, as they grow, draw soil toward them until they are ridged an inch or more above the level. Provide trellis of poultry wire, brush or strings. For long season of bloom cut the flowers daily. Dwarf sweet peas need no trellis and may stand as close as twelve inches.

PEONY. Plant the crowns two inches deep in rich, moist garden soil, first having shaken off any old soil. When well established and well fed they should produce blossoms abundantly for a quarter of a century. They will also thrive in poorer soils.

PENTSTEMON. See BEARD-TONGUE.

PETUNIA. Sow the seed in a hotbed or coldframe, and when the seedlings are a few inches high transplant about eighteen inches apart in good soil. Later sowings may be made in the garden. Double varieties produce less viable seed than single ones. The double and some of the choice single ones are often propagated by cuttings.

PHLOX, ANNUAL (*P. Drummondii*). For earliest plants, sow the seed in a hotbed or coldframe in early spring and transplant the seedlings when a few inches tall about eight inches apart in good garden soil. Sowings may also be made in spring out of doors when the soil has become warm, or in late autumn where the plants are to stand the following season. The first method is usually most satisfactory.

PHLOX, PERENNIAL. Plant the nursery-grown plants in rich, fairly moist loamy soil. Divide the slowly enlarging clump every five years or perhaps oftener. Give annual dressings of stable manure, and keep clear of weeds, especially grasses, in the clumps. By pinching out the tips of the shoots in late spring the blossoming season may be changed to late summer instead of early summer.

PHLOX SUBULATA. See MOSS-PINK.

PINK. See DIANTHUS.

PLUME GRASS. See RAVENNA GRASS.

POKER PLANT. See FLAME-FLOWER.

POLYANTHUS. Treat like half-hardy primroses. See PRIMROSES. Sow the seed as soon as possible after its collection. A mild greenhouse or hotbed will suit them. The soil should be light, fairly rich and porous, and until the plants are well established should be partially shaded. The hardy kinds do well out-of-doors in partially shaded situations where the soil never becomes dry and where the air is humid. In warm and dry situations they fail. The choice varieties may be propagated by cuttings or division. The half-hardy kinds and those most susceptible to dryness may be bedded out each spring like pansies and removed to deeper shade and greater moisture as soon as they have flowered, their place being taken by other plants. During winter they may be kept in coldframes, previously having been divided.

POLYPTERIS. Start under glass, transplanting the seedlings when about two inches tall to small pots or flats, and when the weather becomes settled to the open ground in a rather sunny sandy place. Allow about two feet between plants. Later sowings may be made in the open ground.

POPPY (*Papaver*). Sow the seeds in early spring where they are to remain, since the plants will not bear transplanting. Choose, when possible, a moderately rich sandy loam, and thin the plants to not less than nine inches for the small growing annuals and eighteen inches for the larger kinds. To lengthen the season of bloom, allow no seed capsules to ripen on the plants. The perennial species may also be propagated by division of the clumps and also by root cuttings taken in autumn and grown under glass. They usually require about twice as much room as the annuals.

POPPY, CALIFORNIA (*Eschscholzia*). Best results are obtained from seed of the present season sown in the early autumn where the plants are to remain, protected during the winter with a light mulch of litter or leaves, thinned to about ten inches apart in spring. They may be thinned to half this distance in the autumn, if they are numerous or crowded. The seeds may also be sown in the open ground in early spring, but they are then rather slow and uncertain compared to fresher seed.

POPPY, MEXICAN (*Mentzelia*). Sow seeds in early spring in a mild hotbed or greenhouse and transplant the seedlings to small, well-drained pots when about two inches tall, and when the ground becomes warm to ordinary garden soil in a moist place. They generally do better if the seed is sown in the open ground where the plants are to remain. They need about a square foot of space each and should be planted in masses.

POPPY, PLUME (*Bocconia cordata*). Sow seeds in a mild hotbed or greenhouse in late winter or early spring. Transplant while small to pots, and when the weather has become settled transfer to the open ground, setting the plants about five feet apart. Will thrive in any soil, but will produce largest specimens in rich. May be grown readily from pieces of root.

POPPY-MALLOW. Sow seeds in early spring in a mild hotbed or greenhouse and transplant the seedlings while still small to pots or flats, and when the weather becomes settled plant in any good garden soil about a foot apart. Cuttings of the perennial species may be used for further propagation.

PORTULACCA. When the ground becomes thoroughly warm, sow the seed rather thickly in dry light soil in the sunniest situations, and thin out the surplus to about five inches apart. Usually enough seed will be produced to supply the succeeding season's needs. The plants may be transplanted while in full bloom.

PRIMROSE, CHINESE. Sow seeds in a mild hotbed or greenhouse in early spring, so as to have flowering plants by winter. Successional sowings may be made until early summer. Choose light, fibrous potting soil finely sifted. Prick off the seedlings as soon as large enough, first to flats, and when they have three or four leaves to small pots. Give shifts of pots as required. They should be in five or six inch pots by late autumn. They do best at temperatures below fifty degrees and with plenty of food in the form of liquid manure, which should be given only when the pots in which they are to blossom are full of roots. When in blossom they may be taken to the living-rooms. They do better thus managed than if removed earlier. Other "indoor" primroses may be grown similarly.

PRINCE'S-FEATHER (*Amarantus*). Sow seeds in poor soil well exposed to the sun as soon as the ground becomes warm. Thin the seedlings to stand eighteen or more inches apart. Dwarf varieties should stand closer. In rich soil the colours of the foliage and of the flower heads are less brilliant.

PUERARIA THUNBERGIANA. Sow seeds near porches, verandas, or very large trellises. They may be started under glass in pots and the seedlings transplanted when the weather has become settled. The perennial tuberous roots may be used after the plants have become established, or cuttings may be rooted. From Washington southward the tops may live over winter.

PUSCHKINIA. Plant the bulbs like those of SCILLA and CHIONODOXA.

RAVENNA GRASS. Sow seeds in late winter or early spring in the greenhouse or mild hotbed. When the plants are large enough, transplant to small pots and make one or two shifts before setting in the garden when the weather becomes settled. Allow four or more feet between plants. Select a warm place in ordinary garden soil. After becoming established the plants may be propagated by division.

REED, GIANT (*Arundo Donax*). Sow seeds in mild hotbed or greenhouse in early spring and transplant to small pots. When the weather becomes settled plant in ordinary soil eight feet apart as a background for smaller plants. Dwarf varieties may be set four feet apart. If desired, established clumps may be divided.

ROCK-CRESS. See CRESS and AUBRIETIA.

ROCKET, SWEET (*Hesperis*). In early spring sow seeds where the plants are to remain or in a border for transplanting. Allow about eighteen inches between plants, which will form clumps. These may be divided when necessary for further propagation.

ROSE, CHRISTMAS (*Helleberus*). Plant the rootstocks in any good soil, rich, sandy loam preferred. Moisture and shade are favourable. The plants need no further attention than annual manuring, and should be undisturbed for years.

ROSE OF HEAVEN. See LYCHNIS.

ROSE. See Chapter XVIII.

ROSE, ROCK. See SUN-ROSE.

RUDBECKIA. Sow seeds in spring either in the garden or earlier under glass. Transplant as the plants become large enough, either to pots, nursery beds, or to permanent quarters. Any soil or any exposure suits them. After once becoming established the clumps may be divided in spring.

RYE, WILD. See ELYMUS.

SACALINE (*Polygonum Sachalinense*). Sow seed where the plants are to remain. Rather moist, rich soil is most favourable. Very likely to become a pest from the spread of its underground stems.

SAFFRON, MEADOW. See COLCHICUM.

SAILOR, RAGGED. See CORN-FLOWER.

SALPIGLOSSIS. Sow seeds in late winter; transplant seedlings when about two inches tall to small pots. Keep them growing steadily; avoid any kind of check. Set in light, rich, deep, moist soil when danger of frost has passed. They need about eighteen inches space. Seed may also be sown where the plants are to stand and the excess thinned out. For winter bloom the seeds may be sown in midsummer or later, and the plants kept growing steadily in rather frequent shifts of pots until they approach the flowering stage, when they may be allowed to become pot-bound.

SAGE, SCARLET (*Salvia splendens*). Sow seeds in late winter in a greenhouse or hotbed; transplant when an inch or two tall to small pots, and again if necessary before setting in ordinary soil eighteen inches apart, after danger of frost has passed. Greenwood cuttings may be easily rooted in a warm soil or in the greenhouse.

SALVIA. See SAGE, SCARLET.

SCABIOSA. See MOURNING-BRIDE.

SCHIZANTHUS. See BUTTERFLY-FLOWER.

SCILLA. Plant the bulbs in mid-autumn in good garden soil, in beds or upon the lawn, and leave them to themselves. If desired to remove them, dig after the foliage has turned yellow, dry in the shade and store in a cool, airy room until planting time.

SEDUM. Sow seeds in mild greenhouse or hotbed during winter or early spring; transplant to flats when large enough, and to the garden when the weather becomes settled. From four to eight inches are the usual distance for planting. The soil should be sandy and well drained, especially if the plants are to remain outdoors during the winter, which some may. For further propagation, offsets are usually employed. They are taken in summer or autumn and from their increase during winter a supply should be ready by spring. They need little care.

SHELL-FLOWER (*Moluccella*). Sow seeds where the plants are to remain or in a mild hot-bed for transplanting; first to small pots and later to ordinary garden soil. Allow about eighteen inches between the plants. Select some part of the garden where the plants may self-sow or where the volunteer seedlings will not be obnoxious as weeds.

SHOOTING-STAR (*Dodecatheon*). Propagation by seeds is slow. Use divided plants when possible. Plant in partial shade in fairly rich, well-drained but moist soil. Good among rocks. The leaves die after the plants flower.

SILK OAK (*Grevillea robusta*). For winter ornamental purposes sow the seeds during the previous February or March in ordinary potting soil; transplant the seedlings to small pots when about two inches tall, and give frequent changes of pots as root development seems to demand. By Christmas time the plants should be in four- or six-inch pots. They may be managed as easily as geraniums, and will stand as much bad usage. A new lot of seed should be started each year, since the plants become bare below as they become large.

SNAPDRAGON (*Antirrhinum*). Sow seeds in early spring under glass and transplant the seedlings to small pots or flats when large enough to handle. When the weather becomes settled place the plants about a foot apart in the garden, allowing about a foot between the smaller kinds and eighteen inches between the larger. Any garden soil. These plants should blossom in late summer, if not earlier. For earliest spring blossom and for winter use the seeds may be sown in late summer, the plants that are to bloom during the winter being removed before cold weather, the others, which are to blossom where they remain, being protected with a light mulch of straw or leaves until spring.

SNOWDROP (*Galanthus*). Plant the bulbs about three inches deep in any good soil, upon the lawn or in beds, in clumps or chains. They need not be removed from the beds for years. If desired to dig them, do so after the foliage has turned yellow. Dry in the shade, clean and store in a dry, airy place until planting time. In lawns, the grass often chokes the bulbs in three or four years, and renewal is necessary.

SNOWFLAKE (*Leucojum*). Plant the bulbs two inches deep in ordinary garden soil in autumn. Allow the foliage to die naturally before digging for division, which should occur as soon as the plants show signs of deterioration. Useful for planting in lawns like snowdrops.

SPIRÆA. Usually propagated by cuttings of green or mature wood, often also by seeds sown in spring. The plants usually thrive in all moderately moist soils except the lightest and heaviest; some, however, demand dry ground, thus being useful for planting among rocks; others (a few) wet and peaty situations. As with soil the species and varieties stand all degrees of shade (except the deepest) and light, even to full sun. But there is such a large number of kinds that enumeration for specific situations is impossible here. Their season extends from early spring until late autumn, the former generally being profuse bloomers of only a few weeks' duration, the latter less floriferous but of extended season.

SQUILL. See SCILLA.

STERNBERGIA. Plant the bulbs about six inches deep in rather heavy, dryish soil, well exposed to the sun. They may remain until they show signs of failing, when, after the tops have died down, they may be dug, divided and reset in a new place.

STOCK, TEN WEEKS. Sow seeds in a mild hotbed or greenhouse in early spring; transplant the seedlings when about two inches tall to small pots, and when the ground becomes warm to ordinary garden soil about twelve or eighteen inches apart. Later and successional sowings may be made in the open ground. For winter bloom seed may be sown successionally, beginning in late summer. The plants grow readily from cuttings.

STONECROP. See SEDUM.

SULTAN, SWEET. Sow seeds in early spring where the plants are to remain and thin to about eighteen inches apart. Any garden soil. Make successional sowings. For winter use sow successionally, commencing in late summer. If desired, may be started in a mild hotbed or greenhouse and transplanted to small pots when about two inches tall. When spring opens they may be set in the garden.

SUNFLOWER (*Helianthus*). Annual sunflowers are raised from seed usually sown where the plants are to remain, the plants being allowed to stand from two to five feet apart according to species. The perennial species are generally divided after once having become established. They nearly all thrive best in a light, even sandy soil.

SUN-ROSE (*Helianthemum*). Sow seeds in rather poor soil where the plants are to remain; thin the small kinds to about six inches, the large ones to twelve inches,. In the north give a light mulch of litter or leaves during winter.

SWEET PEA. See PEA, SWEET.

TEA, OSWEGO. See BALM, FRAGRANT.

TIGER-FLOWER. See TIGRIDIA.

TIGRIDIA. Plant the corms in any good garden loam, commencing when the ground becomes fairly warm and continuing at intervals of ten days or two weeks until about June 1st. The corms should be from five to ten inches apart and three inches below the surface. At the approach of cold weather, dig the corms, dry well, divide, and store like gladiolus corms in dry, airy quarters.

TOBACCO. See NICOTIANA.

TORCH LILY. See FLAME-FLOWER.

TRITOMA. See FLAME-FLOWER.

TRITONIA. Treat like MONTBRETIA, which see.

TUBEROSE (*Polianthes*). Plant the bulbs in mid or late spring, about one inch below the surface and about six inches apart in good, light loam. Only such bulbs as have not a woody piece of last year's stem or a brownish cavity in the center are of use for blossoming purposes. Before frost, dig, dry, clean and store the bulbs in an airy, frost-proof dark room. The offsets should be cut off at planting time and, if desired, planted by themselves. They may require two years to attain blossoming size. The old root should also be trimmed off at planting time.

TULIP. Plant bulbs about four inches deep in autumn, and protect with light mulch during winter. When foliage turns yellow, dig, dry in a shady place, clean, and store in airy quarters until autumn. If desired, the bulbs may be left for two years.

VERBENA. Sow seed in midwinter or until early spring in the greenhouse or a hotbed; transplant when an inch or so tall to small pots and set in ordinary soil two feet apart as soon as danger of frost has passed. In good soil they need more room. Choose new situations each year. For the propagation of a particular variety or colour cuttings of sturdy shoots must be used, since seedlings are rather unstable as to colour. Germination of the seeds is thought to be hastened by soaking in warm water over night.

VIRGIN'S BOWER. See CLEMATIS.

WOOL GRASS. See RAVENNA GRASS.

WANDERING JEW. See ZEBRINA.

WINDFLOWER. See ANEMONE.

XERANTHEMUM. Sow seeds in the open ground where the plants are to remain and thin out to about eighteen inches. They may be started under glass if desired.

YUCCA. Propagate by means of offsets, seed, stem, and rhizome cuttings. Plant in any good soil, sandy loam preferred. Set the plants about four feet apart in groups. They like sun and will do well among rocks.

ZEBRINA. Set plants under greenhouse benches, in hanging baskets, vases, etc. Readily propagated by means of layers or cuttings.

ZEPHYRANTHES. In autumn or during winter plant in pots of ordinary potting soil and plunge in a moist place under the greenhouse bench. The earlier planted specimens may be expected to bloom toward spring, if not allowed to become dry. Winter is, however, the resting season. When the weather becomes settled they may be transplanted to light, fairly rich soil. The bulbs may also be wintered in a rather moist place and planted in the spring. Long successions may be managed by combining these two methods. In the garden the plants should stand eight inches apart and the bulbs three inches deep. In autumn dig, divide the bulbs, and either plant or store.

ZEPHYR-FLOWER. See ZEPHYRANTHES.

ZINNIA. Sow the seed in early spring in a hotbed; transplant when a couple of inches tall to flats or pots and set in the open after frost has passed. For later blossoms sow in the garden where the plants are to remain and thin out the excess to about two feet. Dwarf varieties may be set as close as five inches.

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